DOCUMENT RESUME

ED 468 002 EF 006 191

AUTHOR	Bernstein, Tobie
TITLE	Healthier Schools: A Review of State Policies for Improving Indoor Air Quality. Research Report.
INSTITUTION	Environmental Law Inst., Washington, DC.
SPONS AGENCY	Environmental Protection Agency, Washington, DC. Office of Radiation and Indoor Air.
REPORT NO	ELI-Proj-960909
ISBN	ISBN-1-58576-034-X
PUB DATE	2002-01-00
NOTE	64p.
CONTRACT	X-824881-01
AVAILABLE FROM	Environmental Law Institute, 1616 P St., N.W., Suite 200, Washington, DC 20036 ($15.30 members, $18 non-members). Tel: 202-939-3800; Fax: 202-939-3868; e-mail: law@eli.org. For full text: http://www.elistore.org/reports_detail.asp?ID=56.
PUB TYPE	Reports - Descriptive (141)
EDRS PRICE	EDRS Price MF01/PC03 Plus Postage.
DESCRIPTORS	Air Pollution; Child Health; Elementary Secondary Education; Hazardous Materials; Policy Analysis; *Schools; *State Regulation
IDENTIFIERS	*Air Quality Standards; *Indoor Air Quality

ABSTRACT

Existing indoor air quality (IAQ) policies for schools reflect the variety of institutional, political, social, and economic contexts that exist within individual states. The purpose of this report is to provide a better understanding of the types of policy strategies used by states in addressing general indoor air quality problems. The policies discussed illustrate approaches that states can consider when developing legislation, regulations, guidance documents, and programs to create healthier indoor environments in schools. The report provides detailed information on existing policies, with an emphasis on policy strategies aimed at preventing indoor air quality problems. Thus, the report focuses on policies that promote better maintenance and management of existing school facilities, as well as better design and construction practices in new and renovated schools. Additionally, since an IAQ policy has little value unless implemented, the report highlights significant implementation activities and notes potential strengths and weaknesses of individual policies in this regard. (EV)

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ENVIRONMENTAL LAW INSTITUTE
RESEARCH REPORT

HEALTHIER SCHOOLS

A Review of State Policies For Improving Indoor Air Quality

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ACKNOWLEDGMENT

This report was prepared with support from the U.S. Environmental Protection Agency's Office of Radiation and Indoor Air, Indoor Environment Division under Assistant Agreement Number X-824881-01. The report was written by ELI Senior Attorney Tobie Bernstein with editorial assistance from ELI Research Associates Verena Radulovic and Elizabeth Seeger. The views expressed herein should not be attributed to EPA, nor should any official endorsement be inferred.

Healthier Schools: A Review of State Policies For Improving Indoor Air Quality

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ISBN No. 1-58576-034-X. ELI Project No. 960909.

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EXECUTIVE SUMMARY

Overview

Schools are central to the life of local communities and to the nation as a whole. An estimated 20 percent of the population spend their days in elementary and secondary school buildings. Yet this critical component of our national infrastructure is crumbling. School buildings in every state, county and city in the country have environmental problems that adversely affect the health, well-being and productivity of students and staff.

One important component of the school environment affecting health and productivity is indoor air quality (IAQ). Studies reveal an alarming percentage of schools with facility problems related to indoor air quality. One problem that has drawn widespread attention in recent years is mold contamination, which may result from a wide range of structural, mechanical and materials-related conditions that lead to excess moisture indoors. Other sources of indoor air quality problems are volatile organic chemical emissions from furnishings and materials; chemical emissions from improper use or storage of maintenance products or educational supplies; insufficient fresh air due to poorly designed or maintained ventilation systems or to overcrowding; entry of pollutants from outside due to improper siting or design of the ventilation system; and high radon levels. Indoor air quality problems can also result when asbestos or lead in building materials is disturbed during repair or renovation activities.

The effects of poor indoor air quality on health, learning and general well-being are wide ranging, and include allergies and asthma, increased rates of infectious diseases, chronic sinusitis, headaches, and a variety of respiratory diseases. Children are particularly vulnerable to the health effects of indoor pollutants, since their bodies are still developing and they have relatively higher rates of breathing and metabolism. Asthma, a condition that can be triggered by mold, cockroach dander and a number of indoor environmental conditions in schools, has become the leading cause of school absenteeism due to chronic illness.

The federal government addresses indoor air quality in schools through a number of education, research and grants programs, though there is currently no federal scheme regulating indoor air quality generally in schools. There is considerable potential for additional policies and programs at the federal level, however this report focuses on the role of *state* policy in ensuring healthier school environments. While school districts are also key players in the creation and implementation of school facility policies, there are over 14,000 school districts across the country; states can play an important role in establishing frameworks that require, facilitate and encourage local action to improve public health and education.

The purpose of this report is to provide a better understanding of the types of state policy approaches being used and to facilitate the further development of effective policies in this area. The report focuses on policies that emphasize *preventing* indoor pollution through better maintenance and repair practices in existing schools, as well as better design and construction practices in new and renovated schools. Because the quality of indoor air is affected by many individual pollutants and pollutant sources, as well as by numerous building management and construction practices, this report does not include all state policies that potentially relate to indoor air quality. Additionally, the policies included in the report address

"general" indoor air quality issues. State laws and regulations governing specific pollutants, such as asbestos, lead and pesticides, have been the subject of considerable analysis already and are not included here.

State policies focused directly on preventing general indoor air quality problems in schools are concentrated in a relatively small number of states. Yet schools across the country have been affected by indoor air quality problems, and increased attention to policies aimed at prevention can benefit schools in all states. While there is no template or model policy used by states currently, many of the policies adopted so far demonstrate approaches that can help improve indoor air quality in schools. Some of these policies utilize existing administrative programs to focus attention on IAQ issues, while others create new programs. For example:

- State school construction funding programs, and their attendant approval processes, are a potentially powerful mechanism for focusing local attention on key elements of the design and construction process that affect the quality of the indoor environment.
- School environmental or sanitary inspection programs provide a vehicle for ensuring that schools undertake important, routine maintenance practices, as well as larger school repairs.
- Some states have developed programs to provide financial aid for school repairs, and they have used these programs to help ensure that schools adopt the routine maintenance necessary for preventing indoor air quality problems.
- A number of states have developed formal training and education initiatives aimed at building the capacity of local health and school officials to undertake key maintenance and school construction practices.

Most of the policies described in this report are relatively new and are in the early states of implementation. Thus, the report does not purport to assess the effectiveness of current policies, or to show what works and what does not. Instead, the report summarizes the main implementation efforts to date and highlights some of the unique challenges facing states in carrying out IAQ policies. For example, since school and local government officials play an important role in handling IAQ issues, support for local agencies – in the form of education, training, technical assistance and/or financial assistance – is an important consideration for state policy makers. In addition, because state IAQ programs are often understaffed and underfunded, mechanisms and resources for state implementation are particularly important elements of state policy in this area. Finally, given the multitude of state agencies that play some role in IAQ issues, state policies can be more effective if they provide for coordination and communication among these different state agencies in carrying out the policy.

The remainder of this summary highlights the policies discussed in the report. These policies illustrate approaches that states can consider in developing laws, regulations and guidance aimed at preventing indoor air quality problems in schools. The report does not suggest, however, that the policies discussed here represent the only or best options for future policy initiatives. The potential health, academic and financial problems created by poor indoor air quality

call for more concerted action to develop creative, comprehensive strategies at the state level. The challenge is to build on existing efforts and continue to develop programs that will improve the indoor environment in schools. Indeed, the growing body of knowledge on how to create "high performance" schools that integrate indoor environmental quality with energy efficiency, material selection and other resource conservation goals provides a foundation for state policies to promote a new approach to building and maintaining schools – one that reflects their fundamental importance to children, staff, the local community and society as a whole.

Key State Policy Approaches: Maintenance and Management Practices in Existing Schools

The report discusses current state policies that aim to promote good IAQ maintenance and management practices – practices that help school buildings operate properly, that prevent and correct quickly deficiencies that may lead to serious IAQ problems, and identify and address capital projects necessary to improve indoor air quality. The policies included in the report fall within the following four general categories: (1) traditional regulatory mechanisms, (2) information and training, (3) funding/financial incentives and (4) public right to know. The report describes notable examples of each of these approaches, but does not attempt to include every existing state policy. While some states have taken other approaches to addressing this subject – for example, by undertaking research or by establishing advisory committees to investigate the problem – those approaches are not covered in the report.

1. Traditional Regulatory Mechanisms

Although indoor air quality is viewed as a largely "unregulated" area, certain regulatory requirements have been established to prevent indoor air quality problems in existing schools. The report discusses three types of regulatory approaches used by states.

Requiring that schools adopt maintenance plans or specific maintenance practices. This is one of the most common state policy approaches to preventing indoor air quality problems in schools. States have used education and labor laws and regulations to require schools to adopt IAQ maintenance plans and management programs. One important consideration is the extent to which such a policy specifies the required maintenance practices. State policies vary somewhat in how they balance the need for specificity in ensuring sound plans with the need for flexibility to accommodate the great variation in size and capacity of school districts. For example, Maine law requires the establishment of a state maintenance template, and Minnesota law requires the state to develop written guidance for school districts in adopting an IAQ management plan. In other states, such as New York, the state law and regulations require the development of a maintenance plan, but leave the details to the school districts.

In addition, or as an alternative, to requiring a general maintenance plan, some state policies have set out specific required maintenance practices, most often relating to the ventilation system. New Jersey has also included a more general provision in its labor regulation requiring mold prevention practices such as prompt repair of leaks and removal or replacement of wet materials.

Whether the state policy calls for general maintenance plans or specific minimum practices, a central question is how to ensure implementation by schools. While maintenance plans themselves help establish greater accountability, the goal of such a policy is not merely for schools to have the plan on file, but to carry out the sound maintenance practices incorporated in the plan. Record keeping requirements for routine maintenance activities may help promote implementation. In addition, other aspects of state policy discussed separately in this report – school inspection programs, education and outreach activities to school facilities personnel, and provisions for greater public participation in decisions about school conditions – can complement the requirement that schools adopt maintenance plans and practices.

Establishing school inspection requirements. School inspection programs are a potentially significant tool for encouraging schools to focus attention on basic operations and maintenance practices that can prevent IAQ problems. States have structured school health and safety inspection programs in different ways, and the extent to which these programs effectively address indoor air quality depends on a number of factors.

First, it is important to consider which agency is responsible for conducting the inspection. While state agencies generally do not perform the inspections, some occupational health and safety programs authorize the state labor agency to conduct inspections in response to school employee complaints.

States such as Washington require local health departments to carry out inspections. North Carolina requires the state to inspect schools, but the Department of Health has authorized local health departments to assume this function. There tends to be considerable variation in the extent to which local health departments emphasize IAQ issues in school inspections, due in large part to resource constraints and the need for training of inspectors.

Other states have required local school districts themselves to carry out the inspections. In New York, for example, the state law and regulations specify the local team that is to conduct the inspection, including not only a school district official, but also a local code official and a school health and safety committee representative. Maine state law requires school districts to conduct annual sanitary inspections, as well as inspections of the heating, ventilation and air conditioning (HVAC) systems.

Second, it is important to make clear the IAQ-related criteria included in the inspection. If an inspection program is to succeed in changing facility practices, the agency conducting the inspection, as well as the school district itself, must understand which IAQ-related conditions or problems are considered to be "failures" or inadequacies according to the inspection criteria. Moreover, if the standards used to judge school IAQ-related conditions are not described adequately, the inspection program is less likely to achieve consistent results across the state.

In New York, the education law and regulations explicitly list a number of IAQ-related building conditions that must be included in the inspections, and schools are required to use a state-created form for conducting the inspections. Some states, such as Washington and North Carolina use a more general list of sanitation criteria to evaluate school facilities. However, Washington supplements its checklist of required sanitary items with additional

"recommended" practices, and uses this mechanism to promote the IAQ best management practices contained in the state manual. North Carolina has begun conducting extensive training of local health department personnel to increase capacity for conducting inspections relating to IAQ conditions. The state of Ohio is in the process of amending its school environmental inspection report form to explicitly include a number of items related to indoor air quality.

Third, the effectiveness of school inspection programs will depend in large measure on how the programs provide for reporting inspection results and correcting deficiencies. As with any building inspection program, a key factor is the resources available to state or local officials to provide oversight and enforcement. In New York, for example, state law establishes accountability by requiring schools to report inspection results on a fixed date each year. In North Carolina, the state health department must report inspection results to the state education agency. In addition, the state of Ohio requires local health departments to abate nuisances found in schools and further empowers health agencies to order schools to correct conditions that are detrimental to health or well-being. New York establishes a safety rating system for schools that includes information on measures taken to address indoor air quality. If a structural system or a system relevant to health and safety is found deficient, a school may lose its certificate of occupancy.

Providing state oversight of school spending on IAQ maintenance activities. Deferred maintenance has long been viewed as a significant factor in the deterioration of school facilities. Competition for resources with curricular and other programs, as well as with other facility needs, presents a key challenge for efforts to promote facility maintenance and management practices that can prevent indoor air quality problems.

The state's role in overseeing spending by school districts varies from state to state, and a full discussion of policies that seek to ensure that school districts allocate adequate funds for maintenance and capital projects is beyond the scope of this report. One approach that has been used is to establish criteria or a formula for maintenance spending. For example, Maine law requires school districts to commit resources to their maintenance and capital improvement program according to criteria established by the state. In Massachusetts, state law and regulations require that schools spend a minimum percentage of the funds they allocate for ordinary and extraordinary maintenance. Another strategy is to establish state matching funds if a school district allocates a certain amount for maintenance or capital projects. California is an example of a state that takes this approach with respect to major repairs or replacement of building systems, and further requires any school district that does not allocate or spend the required amount to provide a public explanation for failing to do so.

2. Information and Training

Another approach that states have taken to prevent indoor air quality problems is to provide information and training on sound facility operations and maintenance practices. Many states have developed informational materials and have provided direct technical assistance without the benefit of a formal policy directive. Legislation may be necessary in some circumstances, however, to provide a state agency with authority and

resources to develop and disseminate IAQ information.

Some states have adopted policies directing a state agency to develop written guidance on IAQ issues. A notable example is a Washington state law directing the departments of education and health to create an IAQ best management practices manual for schools and providing $70,000 for the task. The detailed manual developed by the state Department of Health has become a focal point for state IAQ education activities and is widely used both within and outside Washington. Another prominent example is a Texas law requiring the state Department of Health to create voluntary guidelines for addressing indoor air quality in schools. The resulting guidelines, which take the form of an outline of key practices, have also served an important role in focusing attention on preventing indoor air quality problems through good maintenance.

Other states have adopted policies that assign the state a broader, ongoing role in IAQ education and training. For example, Vermont's recently enacted indoor air quality law requires three state agencies to provide training and technical assistance to school officials, and to maintain an internet-based clearinghouse of IAQ information for schools and the public at large. New Jersey's occupational health and safety law establishes an ongoing educational and technical assistance role for the state health agency on a range of matters, including IAQ in schools, and the state has been active in producing written IAQ materials. In addition, West Virginia's law directs the state Department of Education to provide schools with technical assistance on HVAC issues.

3. Funding and Financial Incentives

States differ widely in how they provide funding for school maintenance and repair activities. While an examination of these funding schemes is not undertaken here, the report highlights some state policies that target funding for IAQ repairs and improvements. Given the scarcity of resources to address school facility needs, as well as the competition for funds with curricular and other school programs, state policy can play a critical role in this area.

Two states in particular have developed programs to fund repairs to improve indoor air quality. In Minnesota, the state has created the Capital Expenditure: Health and Safety program to provide funding to schools for health and safety repairs. The program specifically authorizes requests for projects to address IAQ issues in existing school facilities. Approximately 85 percent of school districts in the state receive aid under the program, and according to state officials, IAQ projects represented the single largest category of requested aid in fiscal year 2001. As a condition of receiving aid, the state education agency requires that school districts submit the IAQ management plans required by state law, and the agency is taking a number of steps to educate districts on the necessary components of those plans.

Maine's School Revolving Renovation Fund provides financial assistance to schools for repairs and renovation and includes indoor air quality improvements as one of several areas with priority status for receiving assistance. Applicants for funding must submit a copy of the maintenance plan that is required under state law.

In addition, state school construction funding programs can be used as an incentive for school districts to implement sound maintenance practices that will prevent

indoor air quality problems from occurring in the future. For example, Maine explicitly requires that school districts submit a facility maintenance plan in order to receive state school construction funding. Massachusetts law provides that school districts may not receive state funding for school construction and emergency repairs unless they have spent a minimum percentage of the funds that they have allocated for ordinary and extraordinary maintenance.

4. Public Right to Know

Indoor air quality is a multi-faceted area, encompassing a variety of pollutants that have a range of potential health effects. Information can be a critical tool in helping parents, staff and other members of a school community take action to improve the school's indoor environment. State policy can play an important role in ensuring that the public has access to this information.

Yet the creation of information access requirements alone does not ensure that information will actually reach the people who need it most. Some key aspects of public policies that promote a community's right to know are: (1) mechanisms for informing community members that they have the right to obtain specific information; (2) methods for making information accessible to all community members, including those with limited resources or educational backgrounds; and (3) inclusion of practical information to help people understand what steps they can take if they wish to pursue a question or concern about indoor air quality.

Outside of the area of pesticide use in schools, which has been the subject of considerable state legislation in recent years, there have been few state policies focusing on public participation and access to information as mechanisms for preventing IAQ problems. One exception is New York's school health and safety policies, which establish a number of requirements that promote the community's right to know about school environmental conditions. In addition to requiring public access to school maintenance records, the law and regulations require the establishment of local school health and safety committees that include representatives of school employees and parents. The state also mandates the development of a school facility report card to be disseminated through public meetings.

Analysis of Key State Policies: Design and Construction Practices in New and Renovated Schools

This report discusses three types of policy approaches to promote good indoor air quality in new and renovated schools: (1) traditional regulatory mechanisms, (2) information and training, and (3) public right to know. The traditional regulatory requirements discussed in the report are generally established in the context of state funding programs; for this reason, a separate discussion of state funding and financial incentives for school construction is not included.

1. Traditional Regulatory Mechanisms

One approach to changing the way schools are built is the adoption of design and construction standards or requirements that promote good indoor air quality. Many states provide significant funding for school construction. As part of these funding programs the states often set certain minimum design and construction requirements and establish a process for state

approval of local projects. The report focuses on four IAQ issues that have been addressed through such requirements: IAQ management practices during construction; ventilation; materials and furnishings; and commissioning.

One example is the state of Minnesota, which has used its school renovation and construction review process to address certain IAQ issues. School districts must verify compliance with ventilation and commissioning requirements and must demonstrate that indoor air quality has been considered. New York has incorporated IAQ issues into the state approval process for new school construction through use of a code compliance checklist that lists requirements for IAQ management during construction, as well as for ventilation systems. In addition, New York has adopted regulatory requirements relating to off-gassing of volatile organic compounds introduced during construction. The state manual on school construction expands considerably on these requirements by providing information on IAQ considerations in the selection and use of materials and furnishings.

Another state that has addressed materials and furnishings in its formal policies is West Virginia, which adopted regulations strongly recommending that use of carpeting be limited in new and existing schools. The rules require that schools using carpeting provide maintenance staff with instruction on proper care of carpeting.

Washington is one state that has adopted a local health department approval process encompassing IAQ issues. Washington state health regulations mandate that prior to constructing a school, the school district must submit final plans and specifications to the local health department and must obtain that agency's recommendations and its written approval that the plans meet the state's minimum environmental standards. Those standards incorporate general IAQ-related issues such as odors, condensation, and the need for local exhaust of air pollution sources.

2. *Information and Training*

Information and training about how to prevent indoor air quality problems in new and renovated schools is critically important to changing current school design and construction practices. Some of the state information policies that address maintenance, discussed above, also cover the new construction arena. Indeed, the Washington state law mandating the creation of a best practices manual focuses primarily on new construction. Similarly, the Texas voluntary IAQ guidelines outline sound design and construction practices for schools. New York state's general manual on new school construction includes IAQ-related issues. Like the Washington manual, it incorporates both recommended and required practices. This approach facilitates implementation of existing requirements and also provides a vehicle for educating school districts and building professionals about opportunities for going beyond the minimum required practices.

Another state informational initiative, while not the result of legislation or regulation, is worth noting. The California High Performance Schools (CHPS) initiative is a public/private collaboration involving several state agencies and non-governmental entities to promote the construction of schools that consider indoor air quality, energy-efficiency and other elements of environmental and financial sustainability. The project has produced detailed manuals, training sessions and a set of criteria for certifying high performance schools.

3. *Public Right to Know*

Some policies that address construction activities in occupied schools focus on the public's right to know about IAQ issues as one mechanism for ensuring that design and construction practices protect occupants from indoor air pollutants. One key right to know issue is the provision of advance notice to school occupants that construction activities with potential IAQ impacts will be taking place. New York has adopted such notice requirements through its education law and regulations, while New Jersey has incorporated notice provisions in its occupational safety and health regulations.

Another public participation approach is to require that school districts provide a mechanism for involving the community in the school design and construction process. For example, the local health and safety committees mandated by New York law are charged with monitoring school construction projects. This is a potentially powerful tool for focusing community interest and participation in design and construction decisions that affect indoor air quality.

OVERVIEW OF STATE POLICY APPROACHES

Policy Goal	Policy Approach	Strategies In Use Now
Promoting Better IAQ Maintenance and Management Practices	1. Traditional Regulatory Mechanisms	⏭ Maintenance plans and specified practices ⏭ Inspection programs ⏭ Oversight of maintenance spending
	2. Information and Training	⏭ IAQ guidance and manuals ⏭ Technical assistance, and training
	3. Funding and Financial Incentives	⏭ Funding for building repairs and building condition surveys ⏭ Conditioning state construction funding on adequate maintenance
	4. Public Right to Know	⏭ School health & safety committees ⏭ Public access to maintenance records, budget information
Promoting Better IAQ Design and Construction Practices	1. Traditional Regulatory Mechanisms	⏭ IAQ management practices during construction ⏭ HVAC requirements ⏭ Materials and furnishings selection ⏭ Commissioning requirements
	2. Information and Training	⏭ School construction guidance and best practice manuals ⏭ Public/private training and education initiatives
	3. Public Right to Know	⏭ Advance notice of construction work ⏭ School health & safety committees

Part A

INTRODUCTION

Background

Schools are a vital institution in local communities and in society as a whole. As public discourse continues on the merits of different approaches to improving the quality of education, one fact holds true for all school systems: the condition of school facilities can have a significant impact on the health, well-being and performance of students and school staff.

This report focuses on indoor air quality (IAQ), a key component of a healthy school environment. Indoor air quality has been ranked near the top of environmental risks in a number of government studies. *See, e.g.*, EPA Science Advisory Board, "Reducing Risk: Setting Priorities and Strategies for Environmental Protection" (1990), *available at* http://www.epa.gov/opperspd/history7/reduce/toc.htm (last visited Jan. 8, 2002).

Air quality problems inside school buildings can arise from a variety of sources, such as mold growth from excessive moisture accumulation; volatile organic chemical emissions from furnishings and materials; chemical emissions from improper use or storage of maintenance and educational supplies; insufficient fresh air supply due to poorly designed or maintained ventilation systems or to overcrowding; entry of pollutants from outside due to improper siting or design of the ventilation system; and high radon levels. Indoor air quality problems can also result when asbestos or lead in building materials is disturbed during renovation.

In a 1995 U.S. General Accounting Office survey of 10,000 schools, approximately 27 percent reported unsatisfactory ventilation, and almost 22 percent reported unsatisfactory indoor air quality generally. U.S. General Accounting Office "America's Schools Report Differing Conditions," at 62 (GAO/HEHS-96-103, June 1996). With about twenty percent of the U.S. population spending their days in elementary and secondary schools, the potential health, comfort and productivity impacts of poor indoor air quality are considerable. *See* National Center for Education Statistics, "Public School Student, Staff and Graduate Counts by State, School Year 1999-2000" (May 2001). According to a working group chaired by the California Department of Health Services:

> Both students and school staff may suffer the detrimental effects of poor [indoor environmental quality]. Chemical toxins and biological agents in the classroom can lead to health risks and adverse learning conditions. These can affect many different body systems, and impact health, learning, productivity, and self-esteem. Effects can be both transient and long-term. Symptoms can range from mild discomfort and the perception of bothersome odors to severe illness and permanent injury. Health effects include increased rates of infectious diseases (e.g., influenza and the common cold), eye and respiratory irritation, allergies and asthma, chronic sinusitis, headaches, and an array of respiratory diseases.

California Interagency Working Group on Indoor Air Quality, Committee on Indoor Environmental Quality in Schools, "Indoor Environmental Quality in California Schools:

An Assessment of Needs and Opportunities" at 6 (Unreleased draft, August 1999).

Children are particularly vulnerable to the health effects of indoor pollutants, since their rate of breathing and metabolism are greater (relative to their size) than adults, and since they are still developing. Recently, much attention has been focused on the increasing prevalence of asthma in children, particularly children of color. According to the Environmental Protection Agency (EPA), "(n)early 1 in 13 school-age children has asthma, and that rate is rising more rapidly in preschool-aged children than in any other group. Asthma is the leading cause of school absenteeism due to a chronic illness." U.S. EPA, "Asthma Facts," *available at* http://www.epa.gov/iaq/asthma/intro/index.html (last visited Jan. 8, 2002). Environmental asthma triggers found in school buildings include cockroaches and other pests, mold, and dander from animals in the classroom. Secondhand smoke and dust mites are other known environmental asthma triggers found in schools. A recent National Academy of Sciences report on asthma affirmed the importance of considering measures to address biological contaminants and other indoor asthma triggers. National Academy of Sciences, Institute of Medicine, CLEARING THE AIR: ASTHMA AND INDOOR AIR EXPOSURE (2000), *available at* http://www.nap.edu/books/0309064961/html/ (last visited Jan. 8, 2002). *See also* U.S. EPA, "Indoor Air Quality and Student Performance," *available at* http://www.epa.gov/iaq/schools/performance.html (last visited Jan. 8, 2002)

Poor indoor air quality is an important aspect of school deterioration, but only recently has it begun to receive public attention. In part, this greater focus on IAQ issues has resulted from widely publicized health impacts, school closings and lawsuits, often related to mold infestation. The increased public awareness of indoor air quality problems in schools has led to a greater level of activity in state legislatures around the country. Indeed, schools have been the subject of most of the IAQ-related bills introduced over the past several years.

The federal government addresses indoor air quality in schools through a number of education, research and grants programs, though there is currently no federal scheme regulating indoor air quality generally in schools. There is undoubtedly potential for additional policies and programs at the federal level, however this report focuses on the role of *state* policy in ensuring healthier school environments. In the absence of a federal scheme regulating indoor air quality, states have ample room to develop creative approaches to improving the indoor environment of schools. While school districts are responsible for addressing basic health and safety issues affecting students and staff, with over 14,000 school districts in the country, the states can play an important role in establishing frameworks that require, facilitate and encourage local action to improve health and education.

The quality of school facilities is a subject that falls within a number of areas traditionally of concern to states. Although most states have general legal authorities to require that serious public health problems in schools be addressed, these authorities are mainly used to respond to a problem once it has reached serious proportions rather than to prevent problems in the first place. State policies focusing specifically on IAQ issues could help ensure that school districts take the necessary steps to prevent and address IAQ problems, steps that include developing an IAQ *program*, securing *resources* (financial, informational and other) to carry out the

program, and establishing *accountability for and oversight of* the results of the program.

States face considerable challenges in creating approaches to improving the indoor environment of schools. A principal challenge is that myriad demands already compete for school districts' limited resources and attention. In addition, state policies would likely apply to a large number of school districts that vary greatly in size and character. Another challenge is that indoor air quality involves many different types of pollutants, human activities and building systems, and while much is known about how to prevent and address IAQ problems, the science and technology in this field is still evolving rapidly. A further challenge is that IAQ issues cut across several state agency jurisdictions. While the state education office is often a key agency, the department of health also plays an important role, as do other agencies such as labor and building services.

Purpose and Scope

Existing IAQ policies reflect the variety of institutional, political, social and economic contexts that exist within individual states. The purpose of this report is to provide a better understanding of the types of policy strategies utilized by states in addressing general indoor air quality problems. The policies discussed here illustrate approaches that states can consider when developing legislation, regulations, guidance documents and programs to create healthier indoor environments in schools.

The report provides detailed information on existing policies, with an emphasis on policy strategies aimed at *preventing* indoor air quality problems. Thus, the report focuses on policies that promote better maintenance and management of existing school facilities, as well as better design and construction practices in new and renovated schools. Additionally, since an IAQ policy has little value unless implemented, the report highlights significant implementation activities and notes potential strengths and weaknesses of individual policies in this regard.

The policies included here are laws enacted by state legislatures and regulations and rules promulgated by state agencies. The report also describes some of the activities undertaken by state agencies to implement the policies. While many state agencies undertake programs on school IAQ issues without the benefit of a formal policy, a discussion of those programs is outside the scope of this report.

The quality of indoor air is affected by many individual pollutants and pollutant sources, as well as by numerous building management and construction practices. Therefore, this report does not include all state statutes and regulations that bear on the subject, but rather aims to provide a detailed description of significant policies in this area. Morevoer, the report covers "general" IAQ issues, including control of chemical and biological pollutant sources and ensuring adequate ventilation, but does not cover policies focused on specific IAQ pollutants. For example, the report does not cover asbestos laws and regulations, which are found in most states, or pesticide policies, which have been a subject of considerable state legislative activity and of other reports.

Report Methodology and Structure

Research for this report consisted primarily of identifying and analyzing relevant state laws and regulations. Related written materials produced by state agencies, and generally available through the agencies' web

sites, were also reviewed. In addition, selected interviews were conducted by telephone with state agency officials responsible for, or knowledgeable about, the policies included in the research. Information about program implementation contained in this report is derived from those telephone conversations, as well as from agency materials.

Part B of this report provides an in-depth description of policies aimed at preventing indoor air quality problems in existing schools through sound facility maintenance and management practices. These policies fall within four general approaches or strategies: (1) traditional regulatory requirements; (2) information and training; (3) funding and financial incentives; and (4) public right to know. Some policies are discussed under more than one of these sections. A table is included at the beginning of each section containing a list of the policies included in the discussion.

Part C describes policies that address IAQ issues in the design and construction of new schools. This section includes three policy approaches: (1) traditional regulatory requirements; (2) information and training; and (3) public right to know. Because regulatory requirements relating to new construction are generally established in the context of state funding programs, a separate discussion of state funding and financial incentives is not included in Part C.

Finally, Part D contains conclusions about state policy activity in this area, as well as key considerations for the further development of policy, based on the research undertaken for this report.

Part B

INDOOR AIR QUALITY IN EXISTING SCHOOLS

State Policy Approaches To Promoting Better Maintenance and Management Practices

The problem of deferred maintenance is at the heart of the crisis in school facility conditions. Throughout the United States, school districts must make difficult decisions about how to allocate educational resources among many important, competing programs. Preventive maintenance and routine repairs, along with larger capital projects, have been delayed and resources redirected to curriculum and other needs.

There is broad consensus among IAQ officials and practitioners on the importance of routine facility maintenance and operating practices in preventing indoor air quality problems and in correcting deficiencies before they cause serious problems. The EPA has developed an extensive set of materials for schools on how to put these practices in place. EPA's "Tools for Schools" program identifies several major components of a good IAQ management plan, emphasizing prevention of IAQ problems by establishing and carrying out regular maintenance and management practices. See http://epa.gov/iaq/schools/index.html.

This Part discusses in detail current state policies that aim to promote good IAQ maintenance and management practices – practices to ensure a building is operating properly, to prevent and correct quickly deficiencies that may lead to serious IAQ problems, and to focus attention on needed capital projects affecting indoor air quality. The policies discussed in this Part fall primarily into the following four general categories:

(1) Traditional regulatory requirements;
(2) Information and training;
(3) Funding and financial incentives; and
(4) Public right to know.

While some states have taken other approaches to addressing this subject – for example the development of research projects or the establishment of advisory committees to investigate the problem – those approaches are not included in the report.

1. Establishing Traditional Regulatory Requirements

Some states have addressed indoor air quality in schools through the establishment of traditional regulatory requirements applicable to school maintenance activities. For the most part, these efforts have not involved creation of numerical air quality standards for specific pollutants. Numerical standards most often take the form of minimum fresh air requirements, as well as acceptable ranges for temperature and relative humidity. Instead of numerical benchmarks, these policies tend to focus on key maintenance practices that will help provide adequate ventilation, as well as control moisture, chemical emissions, and particulates.

This section discusses three principal areas of regulatory activity: (1) requiring maintenance plans or specific maintenance activities; (2) establishing an inspection program for school facilities; and (3) providing state oversight of school spending on maintenance. Indoor air quality standards

established by states are discussed insofar as they are linked to such regulatory strategies.

The following chart summarizes the policies ddescribed in this section:

1.A. Maintenance Plans and Practices		
State	Law/Regulation	Brief Description
Maine	Me. Rev. Stat. tit. 20-A, §§ 4001,15918, 15905(6); Code Me. R. § 05-071.64	Education laws and regulations requiring schools to establish maintenance plans based on state-created model and establishing state oversight and financial incentives.
New York	N.Y. Educ. Law §§ 409-d, 409-e; N.Y. Code R. & Regs. tit. 8, §§ 155.3, 155.4	Education law and regulations requiring establishment of indoor environmental plan, including a preventive maintenance plan with an IAQ component.
Minnesota	Minn. Stat. § 123B.57	Education law requiring school districts to establish a health and safety program, including an IAQ component and establishing state oversight and financial incentives.
California	Cal. Code Regs. tit. 8, §§ 1542, 1543.	Labor regulations establishing operating and maintenance requirements for mechanical systems.
New Jersey	N.J. Admin. Code tit. 12, § 100-13	Labor regulation establishing HVAC and mold maintenance requirements and providing for agency inspections and enforcement.
Florida	Fla. Admin. Code § 6-2.001	State education regulations requiring schools to develop maintenance policies and procedures, including certain HVAC maintenance practices for existing and relocatable classrooms.
West Virginia	W.Va. Code §18-9E-3; W. Va. Code St. R. tit. 127, §§ 173	Education rule providing for maintenance of carpeting used in schools.
New Jersey	N.J. Stat. § 34:5A-10.2	Law restricting the use of hazardous substances in schools.
1.B. Inspection Programs		
State	Law/Regulation	Brief Description
New York	N.Y. Educ. Law §§ 409-d, 409-e; 3641; N.Y. Code R. & Regs. tit. 8, §§ 155.4, 155.6	State education law and regulations requiring schools to conduct comprehensive annual and 5-year facility inspections, which include an IAQ component.
Washington	Wash. Rev. Code § 43.20.050; Wash. Admin. Code § 246-366	State health law and regulations requiring local health departments to inspect schools for compliance with state environmental health standards.

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Ohio	Ohio Rev. Code §§ 3707.26, 3707.03	Requires local health departments to conduct semiannual sanitary inspections of all schools. Authorizes health department to "disinfect" any school building, to abate nuisances and to require schools to correct conditions detrimental to health or well-being.
North Carolina	N.C. Gen. Stat. §§ 130A-236, 237	State health law requiring annual health department inspections of schools for compliance with state sanitation standards.
California	Cal. Code Regs. tit. 8, §§ 5142, 5143	Labor regulations requiring schools to conduct inspections of the HVAC system.
Maine	Me. Rev. Stat. tit. 20-A, §§ 6801-A, 6302, 15912, 258-A, 258-B; Code Me. R. § 05-071.125.10	State education law and regulations requiring school districts to conduct annual inspections and providing for inspections by the state education agency in certain circumstances.

1.C. Maintenance Spending Oversight

State	Law/Regulation	Brief Description
Maine	Me. Rev. Stat. tit. 20-A, § 4001; Code Me. R. § 05-071.64	State education law and regulation requiring schools to meet state maintenance and capital improvement spending requirements.
Massachusetts	Mass. Gen. Laws Ch. 70B, §8; Code Mass. Regs. tit. 603, § 38.14	Education regulations requiring school districts to spend a minimum percentage of funds allocated for ordinary and extraordinary maintenance.
California	Cal. Educ. Code §§ 17584, 17584.1	State law requiring school districts to justify publicly the failure to allocate funds for deferred maintenance sufficient to receive state matching funds.

1.a. Requiring Schools to Develop a Maintenance Plan and/or Carry Out Specific Maintenance Practices

The policies discussed in this section require the development of a maintenance plan and/or the adoption of specific maintenance practices. As reflected in EPA's Tools for Schools program, the development of an IAQ maintenance plan is important to ensuring that schools will institute good maintenance practices. In considering the extent to which a state policy should enumerate the IAQ-related elements that are required in the maintenance plan, state policies must balance the need for specificity in ensuring sound plans with the need for flexibility to accommodate the variation in size and capacity of school districts.

Whether or not a state policy requires a maintenance plan generally or sets out specific minimum practices, a crucial question is how to ensure *implementation* of the desired maintenance practices. While maintenance plans themselves help ensure greater accountability of the schools, the goal is not merely for schools to have the plan on file, but to implement the sound maintenance practices incorporated in the plan.

Record-keeping requirements are one mechanism for helping to ensure implementation. In addition, other aspects of state policy can complement this type of requirement and help ensure implementation – *e.g.*, inspection programs and attendant

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penalty provisions; education and outreach to school facility personnel; and public right to know about the condition of school facilities. These policy approaches are discussed in subsequent sections.

EXAMPLE ⇨ MAINE

Summary of Policy: Education laws and regulations require schools to establish maintenance plans based on a state-created model and ensure establishment of plans through state oversight and financial incentives.

Policies: Me. Rev. Stat. tit. 20-A, §§ 4001,15918, 15905(6); Code Me. R. § 05-071.64.

Maine Revised Statutes, title 20-A, § 4001 is an education law that requires school districts to establish and maintain a "maintenance and capital improvement program" for all school facilities. The required program must utilize a maintenance template and software provided by the state Department of Education. The law also requires school districts to commit resources to the program pursuant to standards established by the Department of Education and the Department of Administration and Financial Services. According to regulations promulgated under the law, the required program must include a plan for each building that contains, among other things, a maintenance and replacement schedule for all major building systems (HVAC, roof, interior painting, flooring, etc.).

Maine Revised Statues, title 20-A, § 15918 is a related law that requires the two departments noted above to provide assistance to schools in establishing the maintenance programs. The agencies are directed to provide the maintenance template and software, to assist with initial inventory inputs to ensure consistency and comprehensiveness in local plans, and to provide for electronic reporting of progress on maintenance activities to the Department of Education.

Maine Revised Statutes title 20-A, § 15905(6), enacted prior to the above statutes, provides that the state Board of Education must require school districts applying for state construction funding to establish a facility maintenance plan for the life of the proposed school building. It also requires the state to provide technical assistance to the school districts in implementing this requirement, including the provision of a model facility maintenance plan and other information.

Observations: In Maine, a state with 286 school districts and strong local control over school issues, indoor air quality has been a high-profile issue at the state level. A state task force recently issued a report that offers recommendations for achieving and maintaining healthy indoor air quality in Maine's schools by using pollutant prevention and control strategies. See Maine Indoor Air Quality Council, "Report and Recommendations of the Task Force on School Air Quality" (January 2001). A number of state laws addressing indoor air quality-related issues in schools have been enacted over the past decade. Concurrent with the increase in attention to indoor air quality is an increase in the number of staff addressing school facilities issues in the state Department of Education.

The Department of Education is in the process of implementing the policies described above. The agency is developing a template for capital asset management and one for operations and maintenance. The maintenance template will include three main areas: work orders, preventive maintenance schedules, and inventories. Schools will be able to implement the templates as soon as they receive training from the state.

Maine's policies incorporate strong financial incentives to ensure that school districts will establish the required maintenance plans. Schools receiving state assistance for construction and renovation must develop a maintenance plan for the facility. In addition, school districts must submit their maintenance plans, along with a "functional analysis" of the building, as a prerequisite for receipt of state funding for school repair and renovation (see Part B.3, below). The law also places certain requirements on the state – for example, providing assistance with the initial inventory inputs and establishing electronic reporting of progress in maintenance activities – to help ensure implementation of the maintenance plans. Finally, a separate provision of the state education code authorizes the state to pursue sanctions if a school district is "not in compliance with the reporting, program or other requirements" of the code. Maine Revised Statutes, title 20-A, § 6801(A). The sanctions include withholding state subsidies or referring the matter to the state Attorney General for injunctive or other relief.

EXAMPLE ⇨ NEW YORK

Summary of Policies: Education law and regulations require establishment of an indoor environmental plan, including a preventive maintenance plan with an IAQ component.

Policy: N.Y. Educ. Law §§ 409-d, 409-e; N.Y. Code R. & Regs. tit. 8, §§ 155.3, 155.4.

The state education law addresses a variety of school health and safety issues, including school maintenance, and directs the state Department of Education to develop regulations to implement the law. The law and implementing regulations require school districts to develop a process for establishing comprehensive maintenance plans for all schools and for monitoring the condition of schools. This process must include a comprehensive maintenance plan that incorporates "procedures and guidelines which will contribute to acceptable indoor air quality." The monitoring program under the law and regulations also requires the immediate remedying of serious health and safety conditions and timely resolution of health and safety complaints.

In addition, the regulations require that each school district's five-year, comprehensive long-range facilities plan include a well-designed maintenance plan, along with an assessment of needed building maintenance and repairs.

Observations: New York is still in the early stages of implementing the requirements contained in these recently adopted school health and safety policies. The state does not specify the contents of the required comprehensive maintenance plan, and it is not clear what mechanisms the state will use to ensure that such a plan has been created. The state law and regulations do contain extensive school inspection requirements (described in the following section) aimed at ensuring that appropriate maintenance activities are implemented. In addition, school districts are required to establish health and safety committees to oversee these activities (see Part B.4, below).

The requirement for a school maintenance plan is also tied to a long-standing requirement contained in the education regulations that school districts develop a comprehensive long-range plan for educational facilities. The long-range plan must include an annual assessment of needed maintenance, repair and updating of buildings.

EXAMPLE ⇨ MINNESOTA

Summary of Policy: Education law requires school districts to establish a health and safety program, including an IAQ component, and provides for state oversight and financial incentives.

Policy: Minn. Stat. § 123B.57.

This law addresses capital expenditures made by schools for health and safety projects. The law requires school districts to adopt a health and safety program that includes a management plan to monitor and improve indoor air quality. The law also explicitly provides that in order to receive health and safety revenue from the state for any fiscal year, a school district must submit an application that includes the health and safety program adopted by the school board. (See Part B.3, below). In addition, the law authorizes the state to contract with third parties to provide "management assistance" to school districts for their health and safety projects. This assistance includes identifying, prioritizing and controlling hazards.

Observations: This education law creates both a requirement for establishing an IAQ management plan and a strong financial incentive for complying with the law. The state education agency, the Department of Children, Families and Learning (CFL), has taken a number of steps to help school districts adopt and implement the required plans. First, the agency has developed a "planning model" for schools to follow in developing their plans. The model, which is similar to EPA's Tools for Schools program, is a listing of key elements of good IAQ management: (1) designating an IAQ coordinator; (2) conducting an IAQ assessment; (3) establishing IAQ program goals; (4) building organizational support; (5) ensuring adequate funding and staffing; and (6) developing a written IAQ management plan. According to the model, the IAQ management plan itself should contain provisions on training, communications, complaint response, record keeping, maintenance and operations, an implementation schedule, and review procedures.

Second, the CFL has contracted with service providers to offer management assistance to school districts pursuant to the law. The agency has a contract with nine service cooperatives throughout the state. Each cooperative has a health and safety management professional to assist school districts in that region in identifying and prioritizing hazards and developing plans to correct them. Under this arrangement, the management professionals are required to conduct a walk-through of each school facility at least annually and to write a report of any deficiencies noted. These reports, along with the plans to correct the deficiencies, are required as part of the school district's application for state health and safety revenue.

Finally, to ensure that school districts are aware of the requirement to develop an IAQ plan, the CFL has sent out information about the requirement with its annual "policy letter" to school districts, which contains detailed information about the state health and safety revenue program. The 2001 letter reiterated the requirement that school districts have an IAQ coordinator in place in 2001 and an operational IAQ management plan in place in 2002, or the districts would risk losing all health and safety revenue funding in 2002. Letter from Kenneth Hasledalen and Philip Allmon to Superintendents of Schools (June 5, 2001), *available at* http://cfl.state.mn.us/FACILIT/hsletter.pdf (laste visited Jan. 8, 2002). Included in the letter was a form containing a set of criteria which the CFL developed with the

Department of Health, outlining the district's IAQ responsibilities. In order to obtain future health and safety revenue funding, school districts were required to complete the form, confirming their compliance with each of the listed elements.

According to state officials, approximately 85 percent of Minnesota school districts obtain state health and safety aid. This aid would therefore appear to be a significant incentive for ensuring compliance with the law. Nevertheless, a recent survey by the CFL found that relatively few school districts had the required IAQ management plan in place. As a result, the CFL and the Health Department are undertaking two activities to increase compliance: (1) creation of a more detailed model IAQ management plan; and (2) development of smaller, more targeted training workshops for school districts, which will incorporate preparation of the required plan.

EXAMPLE ⇨ NEW JERSEY

Summary of Policy: Labor regulation requires a preventive maintenance schedule for HVAC systems, specifies certain HVAC maintenance practices, and requires mold prevention and cleanup activities.

Policy: N.J. Admin. Code tit.12, §100-13.

This occupational safety and health regulation requires generally that public employers (including schools) establish and implement a preventive maintenance plan and schedule for HVAC systems. The schedule must be updated to show all maintenance performed on building systems, including the date of the work and the person performing the work. The regulation explicitly requires that a number of practices be incorporated into scheduled maintenance: checking/replacing air filters, belts and motors; lubricating parts; and checking the HVAC system when CO_2 levels exceed 1,000 ppm or if the temperature is outside the range of 68-79 degrees.

The regulation also explicitly addresses mold prevention and cleanup. Employers must undertake prompt repair of leaks, prompt removal/replacement of wet materials, and removal of mold found during maintenance or visual inspection. The regulation specifically states that any part of the HVAC system with standing water should be checked for microbial growth.

Observations: The state labor law and regulations contain general inspection and enforcement authorities that can be used to ensure that schools carry out the required IAQ maintenance activities. The state health agency (the Department of Health and Senior Services) conducts inspections in response to employee complaints. According to officials, the agency does receive complaints from teachers relating to IAQ and conducts inspections of schools on a fairly regular basis. Officials note that inspectors routinely review a school's HVAC maintenance records, including the required preventive maintenance plan, and that they may pursue an administrative order if an inspection reveals visible mold growth.

If the agency determines that corrective action is needed, the agency requests that the Department of Labor issue an order to comply, which provides a time frame for remedying the problem. Penalties for noncompliance are available, though penalties are generally not issued for first violations. According to agency policy, if it is determined that the employer is not making a good faith effort to abate the violation, an Order to Comply establishing penalties will be issued within 20 days. PEOSH Procedural Regulations, N.J. Admin. Code tit. 12, §110-4.11.

In addition to this enforcement function, the Department of Health and Senior Services conducts considerable outreach and education on IAQ issues. (See Part B.2, below.)

EXAMPLE ⇨ CALIFORNIA

Summary of Policy: Labor regulations establishing operating and maintenance requirements for mechanical systems.

Policy: Cal. Code Regs. tit. 8, §§ 1542, 1543.

These occupational safety and health regulations contain maintenance and operating requirements relating to mechanical systems. Among other things, the regulations require that employers (schools) maintain and operate the HVAC system to provide at least the quantity of air required by the state building code at the time the building permit was issued; operate the system continuously during working hours (with exceptions); and maintain the exhaust system to prevent "harmful exposure."

Observations: The principal means for ensuring compliance with the policy is through the general occupational safety and health enforcement process. The regulations aid in ensuring compliance by requiring that the school document all maintenance performed and keep the records on file for at least five years. When the state labor agency inspects a school following a complaint, the inspector can review those records. Failure to comply with the regulations can result in a citation and penalties. Division of Occupational Safety and Health, "Policy and Procedures Manual - P&P C-48" (Aug. 1994).

EXAMPLE ⇨ FLORIDA

Summary of Policy: State education regulations require schools to develop maintenance policies and procedures, including certain HVAC maintenance practices for existing and relocatable classrooms.

Policy: Fla. Admin. Code § 6-2.001.

This regulation incorporates by reference the State Requirements for Educational Facilities (SREF), adopted by the Department of Education. Chapter five of the SREF contains a general requirement that local school districts establish "policies and procedures for the maintenance, sanitation and housekeeping of existing facilities to ensure the health and safety of occupants," as well as procedures for withdrawing schools from use until unsafe or unsanitary conditions are remedied.

The regulations specify certain elements relating to HVAC systems that must be included in the school districts' maintenance policies. For permanent facilities, HVAC filters must be kept clean, serviceable, orderly and sized to prevent unfiltered air from entering the air stream. (SREF § 5.1(e)). In addition, schools must ensure that HVAC systems are "operating as designed." (SREF § 5.16(a)). The regulations include more detailed HVAC provisions governing relocatable (portable) classrooms, including: cleaning filters, coils, and condensate lines; keeping outdoor intake clear of pollutants; and ensuring that there are no indications of mold or mildew in or on carpets, walls, restrooms, and the HVAC system. (SREF § 5.2(b)).

Observations: In addition to establishing a very general requirement for schools to develop maintenance policies and practices, these regulations provide some specific HVAC maintenance practices that must be

undertaken by schools. The regulations do not incorporate a mechanism for state oversight of this particular requirement, although the regulations do require that schools conduct annual inspections for compliance with the standards.

EXAMPLE ⇨ WEST VIRGINIA

Summary of Policy: Education rule providing for maintenance of carpeting used in schools.

Policy: W.Va. Code §18-9E-3; W. Va. Code St. R. tit. 127, §§ 173.

The state education law directs the state to promulgate rules that authorize schools to use any appropriate floor covering based on user needs and performance specifications. The rule adopted by the state Board of Education "highly recommends" that carpeting be restricted to certain types of rooms in the school, and requires that carpet used in existing or new schools meet industry standards, including those for off-gassing and reducing microbial growth. The rule requires that schools proposing to use or replace carpeting provide the state with documentation that the use will "enhance the effectiveness of the teaching environment." Moreover, wherever carpeting is in use in a new or existing school facility, custodial staff for that facility must receive instruction on maintenance of the carpet and on the manufacturer's or industry's recommended frequency and methods of care.

Observations: This regulation helps ensure that schools consider carefully the circumstances in which they use carpeting and that they select carpeting that will minimize indoor air quality problems. By requiring schools to provide justification for the use of carpeting, the state has established a mechanism for evaluating whether such use is appropriate and for ensuring that selection and installation of the carpeting comply with the rules. The rule's requirement that school staff receive instruction on carpet maintenance is a potentially significant mechanism for preventing mold growth and other IAQ-related problems.

EXAMPLE ⇨ NEW JERSEY

Summary of Policy: Law restricts the use of hazardous substances in schools.

Policy: N.J. Stat. § 34:5A-10.2.

This law prohibits the "use of any hazardous substance in or on" any school "at any time when children are expected to be present in the building." The law also provides that the use or storage of hazardous substances must comply with health department regulations.

Observations: According to state officials, implementation of this law has been hampered by its lack of specificity about the circumstances to which it applies. The state has not issued implementing regulations, though the law has been publicized through health department mailings and through consultation with individual schools. It appears that the state has not sought to use the law to restrict the routine use – for example, in cleaning and maintenance – of certain types of products that could be considered "hazardous." Rather, the law is used by the department as a basis for requiring schools to evaluate specific facility projects to ensure that they will be carried out in a safe manner.

1.b. Establishing an Inspection Program for School Facilities

The establishment of school inspection requirements is another common approach to ensuring that school districts maintain their facilities and correct quickly

any problems that develop. Facility inspections may be used to determine whether required maintenance plans or specific maintenance practices, discussed above, are being implemented. In addition, some of the inspection programs discussed below are used to determine whether general state health, sanitary or environmental standards are being met.

States have structured school health and safety inspection programs in different ways. The extent to which these programs will help ensure good indoor air quality depends on a number of factors, including:

- which agency is responsible for conducting the inspection and what type of oversight or accountability is provided;
- what items relating specifically to IAQ are covered by the inspection and how clear it is to school officials which IAQ-related conditions or problems are considered to be "failures" or inadequacies; and
- how the results of the inspection are used to address problems, including whether the policies require reporting of inspection results and correction of deficiencies.

As with any building inspection program, how well these measures work in practice depends in large part on the resources available to provide oversight and enforcement.

EXAMPLE ⇨ NEW YORK

Summary of Policy: State education law and regulations require schools to conduct comprehensive annual and five-year facility inspections, which include an IAQ component.

Policy: N.Y. Educ. Law §§ 409-d, 409-e, 3641; N.Y. Code R. & Regs. tit. 8, §§ 155.4, 155.6.

As noted earlier, New York's education code requires the state to establish and monitor a comprehensive public school building safety program. The law, in conjunction with its implementing regulations, incorporates two principal inspection requirements that address environmental health conditions at school facilities.

First, a five-year building condition survey is required for each facility. The survey (to be conducted by a team that includes at least one licensed architect or engineer) assesses the useful life and need for repair, maintenance or replacement of all major building systems, as well as environmental features such as appearance, cleanliness, acoustics, lighting quality, thermal comfort, humidity, ventilation and space adequacy. (N.Y. Educ. Law § 3641 requires the five-year building condition surveys and authorizes financial aid for schools to conduct the surveys. See Part B.3, below).

Second, annual visual inspections must be completed by November 15 of each year, and are conducted by a team that includes a code enforcement official, the school district director of facilities, and a member of the school health and safety committee. These annual inspections serve as a re-check of items covered by the five-year building condition survey in years when the five-year survey does not take place. The annual inspection reports must indicate if more frequent inspections and repairs are necessary to protect the health and safety of students and staff occupying the school buildings. The regulations also provide that the Department of Education may require more frequent inspections as necessary to

maintain the safety of school buildings and the welfare of the occupants.

A related component of New York's school inspection policy is the annual safety rating for all occupied school buildings, which is determined by each school district after consultation with the school health and safety committee and in accordance with a state-developed rating system. The safety rating is to be used to develop or amend a school district's five-year facilities plan, which identifies critical maintenance needs. Among the requirements of the annual safety rating are: the estimated cost to keep the building in a state of good repair, the projected operations and maintenance spending for the current school year, and the need for routine maintenance, repairs, and other improvements. Several specific types of environmental information must also be part of the rating, including the "(s)tatus of measures taken to assure acceptable indoor air quality."

Observations: New York's law and regulations set up a program of comprehensive health and safety inspections intended to "ensure that all school facilities are properly maintained and preserved and provide a suitable educational setting." The results of the inspections are to be used to assist schools in developing long-range facility plans in a consistent manner. Since the state is in the early stages of implementing these requirements, it is too soon to draw lessons from the state's experience in this regard; however, several features of the state policy are noteworthy.

School districts themselves are responsible for conducting the inspections, although the law requires an inspection team and specifies the composition of the team. One mechanism for ensuring that schools carry out the mandatory inspections is the requirement that schools report the annual inspection results to the state by January 15. However, the regulations do not specify the consequences for failure to provide the report.

The Department of Education's inspection program seeks to ensure some degree of consistency in the standards that are used to judge indoor environmental quality in school facilities. The law and regulations explicitly list several IAQ-related building conditions that must be included in the inspections, and schools are required to use a state-created format for conducting the inspections. The state has developed an Annual Visual Inspection Report form that includes some general environmental criteria such as humidity, ventilation and cleanliness, in addition to specific HVAC items. See http://www.emsc.nysed.gov/facplan/Reports/AnnualVisualInsp_101901.PDF.

The framework established by the law and regulations also contains certain measures to help ensure that schools undertake routine maintenance and address problems detected in the inspections. The state education code requires schools to obtain an annual certificate of occupancy from the Department of Education conditioned on satisfactory results from an annual fire safety inspection. Under the safety rating scheme, a school will lose its certification of occupancy if a structural system or a system that relates to health and safety is rated as unsafe or unhealthy (defined in the regulations as: "System is non-functioning, unreliable or not functioning as designed. System endangers occupant health and/or safety, and/or has deficiencies that have resulted in serious accident or injury.")

Furthermore, Section 409-d(3) of the education code provides that the state education agency is authorized to notify school districts in writing of "the existence of a hazardous condition found in any school

building within the school district that is in violation of applicable building, health, or safety codes or regulations that may threaten the health and/or safety of students or staffs. Such notice must be acknowledged and responded to within five business days or less." Section 155.4(d)(9) of the regulations provide that school districts "shall take actions to immediately remedy serious conditions affecting health and safety in school buildings, and shall report such actions to the commissioner."

EXAMPLE ⇨ WASHINGTON

Summary of Policy: State health law and regulations require local health departments to inspect schools for compliance with state environmental health standards.

Policy: Wash. Rev. Code § 43.20.050; Wash. Admin. Code § 246-366.

Washington's school inspection program is contained in the state health regulations. These regulations were promulgated pursuant to a state law providing the state health department with general authority to adopt rules controlling public health related to environmental conditions in all types of public facilities. The regulations require local health officials to conduct periodic inspections of school facilities to ensure that schools comply with the minimum environmental standards set out in the regulations. The provisions most relevant to indoor air quality include requirements that buildings be kept clean and in good repair, that floors have easily cleanable surfaces, that there be local exhaust for air pollutant sources, and that rooms be kept reasonably free of objectionable odor, excessive heat and condensation. Following an inspection, local health officials are to issue a report with recommendations.

Observations: The Washington model directs local health officials to inspect school facilities to ensure that they are maintained according to state health standards. The state regulations require "periodic" inspections rather than requiring inspections annually or at another time interval. For this reason, allocation of resources is particularly important to ensuring that inspections are carried out. State officials note that local health departments vary as to their degree of involvement in IAQ and other school health and safety issues, due primarily to resource constraints. Some local health departments have an active school health and safety inspection program and play an important role in ensuring good IAQ in schools, while other local health departments are much less visible in these areas.

Another key aspect of Washington's inspection policy is the degree to which the health standards that are being used to guide school inspections address indoor air quality issues. Washington's regulations do not address indoor air quality explicitly, although some provisions are indirectly related. The standards may provide adequate authority for local health departments to require schools to take action, however the lack of specific IAQ provisions may result in inconsistent application of the standards across the state.

It is notable that the state health agency has developed a checklist of health and safety requirements for schools, which can serve to better acquaint not only local health officials, but also school personnel, with the agency's environmental health standards. As a way of promoting IAQ practices that go beyond the state requirements, the checklist also includes "recommendations" made by the health department and other agencies in the area of indoor air quality.

EXAMPLE ⇨ NORTH CAROLINA

Summary of Policy: State health law requires annual health department inspections of schools for compliance with state sanitation standards.

Policy: N.C. Gen. Stat. §§ 130A-236, 237.

North Carolina is another example of a state whose health law and regulations establish a school inspection program. The North Carolina law requires state health officials to establish sanitation requirements for schools, to inspect schools annually, and to submit written inspection reports to the state Board of Education. The law also requires schools to take action immediately to correct conditions that do not meet the sanitation rules.

The law calls on the state Commissioner for Health Services to develop regulations covering issues such as "cleanliness of floors, walls, ceilings" and adequacy of ventilation. The law addresses these issues in a general way, providing, for example, that ventilation must meet the state building code requirements; floors, walls, ceilings and fixtures (*e.g.*, grills and vents) must be kept clean and in good repair; and that the premises generally must be kept neat and clean at all times. The law also directs school officials to use pesticides and other toxic materials as directed, and to handle and store the materials to avoid health hazards.

The state Department of Health and Human Services is required to inspect each school at least once annually for compliance with the law and to complete an inspection report. The law establishes a rating system for schools, ranging from "A" (for those receiving 90 percent) to "unapproved" (for those receiving less than 70 percent). If the inspection results in a rating of "unapproved" or finds an imminent hazard or other conditions that are dangerous to the health of students, the inspector is to notify the school district superintendent immediately and to forward a copy of the inspection report to the local and state superintendents. The statute provides generally that the department is to submit written inspection reports to the state Board of Education.

Observations: According to state health officials, the requirement for annual school inspections is met through local health department inspections. Local health departments are independent of the state agency but are authorized by the state to carry out these inspections. While the local agencies do conduct annual inspections, they do not receive separate funding for it, and some jurisdictions are more active than others in school health and safety matters.

Moreover, since the state law addresses indoor air quality issues somewhat indirectly, training of local health officials is critical to ensuring a thorough school sanitation inspection. The state plays an active role in this regard, providing asthma and IAQ training for local environmental health specialists. According to state health officials, this training program is helping to make indoor air quality issues more central to the functions of the local departments.

While the law explicitly orders school districts to promptly correct deficiencies, neither the law nor the regulations provide a direct consequence for the failure of a school district to do so. Moreover, the regulations flatly state that the "grade cards" prepared by the local health department inspectors "shall not be posted in schools," thus foregoing an opportunity to involve the community in improving school conditions.

EXAMPLE ⇨ OHIO

Summary of Policy: State health law requiring local health departments to conduct semi-annual school inspections and authorizing health department to take action to abate nuisances or correct conditions detrimental to health and well-being.

Policy: Ohio Revised Code §§ 3707.26, 3707.03.

The state health law requires local health departments to conduct sanitary inspections of school buildings. The inspections are to be carried out by the city health department or the general health district (covering towns within a county). The law specifies a minimum of semi-annual inspections.

The Ohio law differs somewhat from the Washington and North Carolina policies in giving the local health departments fairly broad authority to take action to address unsanitary conditions, including IAQ problems. For example, the local agency may "disinfect" any school building, though the law does not elaborate further on what conditions would give rise to such action. In addition, local health departments are required to "abate all nuisances." This section further empowers health agencies to order schools to correct "all conditions detrimental to health or well-being found upon school property."

Observations: The state Department of Health has sought to incorporate further IAQ issues into the school inspection process by drafting revisions to the school inspection report form used by local sanitary inspectors. The draft School Environment Inspection Report lists 16 areas that must be reviewed by the inspector, and contains a list of items to look at within each area. "Indoor Air Quality & HVAC" is one such area and includes the following specific items for review: (1) automatic room temperature controls; (2) inlets and outlets unobstructed; (3) system maintained; (4) free of excessive heat, odor and condensation; and (5) filtration. Some of the other specific items included in the draft form that are relevant to IAQ include:

- Outside air intakes (Exterior Surroundings);
- Condition of carpeting in rooms (Buildings/Interiors);
- Chemical storage (Science Laboratories, Vocational/Industrial Arts, Art Rooms); and
- Integrated pest management (Pest Management).

EXAMPLE ⇨ CALIFORNIA

Summary of Policy: Labor regulations require schools to conduct inspections of the HVAC system.

Policy: Cal. Code Regs. tit. 8, §§ 1542, 1543.

California's labor regulations governing public workplaces require at least annual inspections of a school's HVAC system, along with annual testing of the ventilation rate of every mechanical system. The state may conduct an inspection of a school in response to a complaint from an employee, pursuant to the state's general occupational safety and health law and regulations.

Observations: As discussed in the previous section, these regulations set forth a number of maintenance and operating requirements relating to the mechanical systems that should, presumably, guide the inspections conducted by the school and any inspection carried out by the state in response to a complaint.

EXAMPLE ⇨ MAINE

Summary of Policy: State education law and regulations require school districts to conduct annual inspections and provide for inspections by the state education agency in certain circumstances.

Policies: Me. Rev. Stat. tit. 20-A, §§ 6801-A, 6302, 15912, 258-A, 258-B; Code Me. R. §§ 05-071, 125.10.

State law and regulations in Maine require annual inspections of school facilities. Under Section 6302 of the state's education code, enacted in 1991, school districts must conduct annual inspections of the HVAC system and must correct any problems "within a reasonable time." The school district must maintain written records of HVAC inspections and maintenance for at least five years. The state education rules, adopted in 1996, also require the school to conduct annual inspections of the facilities' sanitary conditions. These regulations, which set out requirements for basic approval and accreditation of schools, direct school districts to correct any deficiencies.

Maine law also calls for inspection of school facilities by the state in certain circumstances. Section 15912 of the education code, enacted in 1981, provides the state with recourse if a school district fails to maintain a school facility "to protect health, welfare and safety" of the people who use the facility. Under such circumstances, the Department of Education may inspect the school and order corrective action. Under section 258-A, enacted in 1983, the state commissioner of education is required to inspect a school and report the findings and recommendations to the school board if: petitioned by 60 percent of the parents of the children of one school; requested by the school board or superintendent of schools; or petitioned by 20 percent of the registered voters of the school district. In 1995, the state enacted section 258-B, which provides that the commissioner must also conduct air quality testing in schools under the same circumstances described above, except that a petition by only 50 percent of the parents of the children of one school is sufficient to trigger the inspection. This section also requires the commissioner to direct school superintendents to notify any citizen who requests a school facility inspection of the petition process.

Observations: The requirement for annual HVAC inspections includes a minimum standard that must be met by HVAC systems. The system must be operated continuously (with certain exceptions) and must provide at least the quantity of outdoor air required by the state building code in effect when the system was installed or when the building permit was issued, whichever was later. The school approval regulations requiring annual sanitary inspections also list the following criterion relating to IAQ: "Each instructional room must have sufficient air changes to produce healthful conditions and to avoid odors, accumulation or concentrations of toxic substances or dust particles."

The school approval regulations do provide sanctions for failure to satisfy school approval requirements, including the sanitary inspection requirement and the required correction of deficiencies. Among the consequences provided in the regulations are: placement on "provisional status," withholding of financial subsidies, or referral for legal action. In addition, the state education code authorizes the state to pursue sanctions if a school district is "not in compliance with the reporting, program or other requirements" of the code. The sanctions include withholding state subsidies

or referring the matter to the state Attorney General for injunctive or other relief.

When the state inspects a school upon petition or upon request from the school, the standards to guide the inspection are the "applicable school approval standards." These standards include the provision for sufficient air changes noted above.

While the state policy providing for state inspections upon petition presents a relatively clear opportunity for state oversight of school health and safety conditions, the law sets a fairly high bar for obtaining a state inspection. Moreover, the air testing provisions, while specifically addressing IAQ issues and concerns, do not provide detail as to the kind of testing that is to be done, how the testing is to be done, or the criteria for evaluating the results.

1.c. Providing State Oversight of School Spending on IAQ Maintenance

One of the most important challenges facing efforts to improve IAQ-related maintenance practices is the need to ensure adequate funding for maintenance activities. Competition for resources with other school programs is an ongoing consideration for state policy makers seeking to promote good indoor air quality through sound facility operations and maintenance practices.

The state's role in providing funding for school facilities varies from state to state. A full discussion of these funding schemes – including the incentives and disincentives they create for undertaking maintenance activities – is beyond the scope of this report. Such an examination is, however important to developing policies to encourage good IAQ management practices. The following are examples of state policies that establish an oversight role for the state in ensuring that school districts allocate adequate funds for maintenance activities.

EXAMPLE ⇨ MAINE

Summary of Policy: State education law and regulation requiring schools to meet state maintenance and capital improvement spending requirements.

Policy: Me. Rev. Stat. tit. 20-A, § 4001; Code Me. R. § 05-071.64.

As discussed earlier, this education law requires schools to establish and maintain a "maintenance and capital improvement program" for all school facilities based on a template provided by the Department of Education. The law also requires that school districts "annually commit resources to that program pursuant to standards established by the Department of Education and the Department of Administration and Financial Services." Regulations implementing the law provide that school districts must submit annual reports to the Department of Education indicating the actual amount budgeted for maintenance and capital improvement, and whether those amounts comply with the district's maintenance and capital improvement plan.

Observations: In implementing this provision, the Department of Education is treating maintenance projects somewhat differently than capital renewal/improvement projects. The department is currently developing a standard governing minimum allocations for capital projects, and plans to condition the receipt of new capital or renovation funds on satisfaction of this standard. For maintenance activities, the agency plans to publish the amount each school district spends per pupil. This approach seeks to use greater public accountability as a mechanism for ensuring adequate maintenance expenditures.

EXAMPLE ⇨ MASSACHUSETTS

Summary of Policy: Education regulations require that school districts spend a minimum percentage of the funds allocated in a given year for ordinary and extraordinary maintenance.

Policy: Mass. Gen. Laws ch.70B, § 8; Code Mass. Regs. tit. 603, § 38.14.

This regulation requires that every school district expend funds for utilities and for ordinary and extraordinary maintenance in an amount "not less than 50 percent of the district's combined foundation budget allotment for those categories for the given fiscal year." The regulation further provides that no school project will be authorized for funding unless the school district is in compliance with this requirement.

Observations: This regulation seeks to address the problem of deferred maintenance by establishing minimum spending levels for maintenance and utilities. By conditioning state aid for school projects on meeting the minimum spending requirement, the regulation creates a strong financial incentive for compliance.

EXAMPLE ⇨ CALIFORNIA

Summary of Policy: State law requires school districts to justify their failure to allocate funds for deferred maintenance sufficient to receive state matching funds.

Policy: Cal. Educ. Code §§17584, 17584.1.

This law requires schools to budget a certain amount of funds for deferred maintenance, based on a prescribed formula, in order to receive state matching funds, unless certain emergency circumstances exist. Any state funds awarded, along with the local funds being matched, may only be used for deferred maintenance project, defined in the law as "major repair or replacement of plumbing, heating, air conditioning, electrical, roofing, and floor systems, the exterior and interior painting of school buildings, the inspection, sampling, and analysis of building materials to determine the presence of asbestos- containing materials, the encapsulation or removal of asbestos-containing materials, and any other items of maintenance approved by the State Allocation Board." If less than the prescribed amount is allocated by the school district, the district must submit a report to the legislature and state agencies explaining why they failed to do so.

Observations: Although this law does not require a specific amount of spending on deferred maintenance projects, it does require schools to budget a certain minimum amount for such projects in order to receive state matching funds. If a school district fails to spend all of the money budgeted, then the state takes back its share. Moreover, school districts that fail to do so must justify their actions in writing and make the information available to the public. Following enactment, the state education agency sent a letter to school districts notifying them of this new requirement. According to state officials, the policy seems to have led at least one large school district – the Los Angeles Unified School District – to budget the required amount after having failed to do so in previous years.

2. Providing Information and Training on Good IAQ Maintenance Practices

Information and training are critical components of any program to ensure good IAQ maintenance practices. Many state education and health agencies have developed

valuable educational materials for school officials on the subject of maintaining good indoor air quality in schools. One notable example is a series of technical bulletins produced by the Maryland Department of Education on topics ranging from carpeting to building ecology. Other examples include "Indoor Air Quality Guidelines for Pennsylvania Schools" (Pennsylvania Department of Health) and "Indoor Air Quality: A Guide for Educators" (California Department of Education). In addition, some states have developed environmentally preferable purchasing guides that include information for school districts on how to buy cleaners, carpets and other less toxic and low-emitting products. The state of Massachusetts, for example, recently produced a "Recycled and Environmentally Preferable Products and Services Guide" that contains a listing of all products under state contract (and available to school district purchasers) that contain environmentally preferable features.

This report does not aim to describe the range of IAQ educational materials produced by state agencies, but rather to highlight two approaches: the enactment of formal state policies creating IAQ educational or training resources for school officials, and the creation of practice manuals that describe both required and recommended IAQ practices.

State	Law/Regulation	Brief Description
Vermont	Vermont House Bill 192	Law requiring the establishment of specific IAQ information and training programs for schools and the public.
Texas	Tex. Health & Safety Code § 385; 25 Tex. Admin. Code § 297.1-.6	State health law mandating creation of voluntary guidelines for IAQ in schools, and regulation promulgating guidelines.
Washington	Wash. Rev. Code § 70.162	State law providing for the development of an IAQ best management practices manual.
Minnesota	Mn. House File No.1 (§26, Subdivision 1)	State education law requiring the state to develop and disseminate a number of manuals and other informational resources.
New Jersey	N.J. Stat. § 34:6A-31.	Labor law directing state labor agency to provide technical assistance on health and safety issues covered by the state labor law.
West Virginia	W.Va. Code § 18-9E-3, 4, 5; W.Va. Leg. Rules 126-173, 175	State education law and rules providing for technical assistance to schools on HVAC problems.

EXAMPLE ⇨ VERMONT

Summary of Policy: Law requires the establishment of specific IAQ information and training programs for school officials and the public.

Policy: Vermont House Bill 192.

The focus of this law is the provision of information on IAQ and environmental health issues in schools. One of the central features of the law is the creation of a web site to serve as a clearinghouse on environmental health. The web site, to be jointly developed by two state agencies (the Department of Health and the Department of Buildings and General Services) must incorporate items specified in the law, including information on common materials and practices that may compromise IAQ; a list of preventive management options; a list of non-toxic or least-toxic supplies, equipment, materials and furnishings; and a list of environmental health criteria that schools may use in determining which materials to purchase or use.

The law also requires the Departments of Health, of Buildings and General Services, and of Education to provide technical assistance at the request of schools, by helping to identify potential sources of environmental pollution and making recommendations on remedying any problems. In addition, the agencies are required to provide training to school officials. The law mandates an annual "school environmental health training workshop" for school environmental health coordinators and school administrators, as well as annual training for school maintenance and custodial staff.

Observations: This law was enacted in 2000 and is in the early stages of implementation. The measure is notable for establishing a training and technical assistance program within three key state agencies, and for allocating an additional staff position for the new IAQ and environmental health functions described in the law.

Example ⇨ Texas

Summary of Policy: State health law mandates the creation of voluntary guidelines on indoor air quality in schools and regulations promulgate the guidelines.

Policy: Tex. Health & Safety Code § 385; 25 Tex. Admin. Code § 297.1-.6.

This 1995 state law required the state department of health to adopt rules establishing "voluntary guidelines for indoor air quality in public schools, including guidelines for ventilation and indoor air pollution control systems." Pursuant to the legislation, the health department created "Voluntary Indoor Air Quality Guidelines for Public Schools," which were adopted as regulations in 1997.

The non-binding guidelines are general in nature and cover a broad range of IAQ issues for existing schools and new construction. With respect to maintenance activities, the guidelines first outline steps to take in the initial development of an IAQ program, as well as in the preparation of a written IAQ management plan. The guidelines then describe several important operations and maintenance topics, including: preparation of a written preventive maintenance program; HVAC practices; microbial management; use of pesticides and cleaning products; housekeeping; training; and record keeping.

Observations: The guidelines adopted by the health department were developed in consultation with an advisory committee. The department has sought to assist school districts in developing their own guidelines

and plans based on the state model and in implementing the EPA's Tools for Schools approach. While a number of schools have begun to use the guidelines, state officials note that additional resources targeted to outreach and education could enhance implementation of the general practices outlined in the guidelines.

EXAMPLE ⇨ WASHINGTON

Summary of Policy: State law provides for the development of an IAQ best management practices manual.

Policy: Wash. Rev. Code § 70.162.

In 1993, Washington enacted a law providing funding for the Department of Education to work in conjunction with the Department of Health to develop best management practices for use by schools in addressing indoor air quality in new or modernized school facilities. In response to the legislation and to the perceived need for practical guidance on addressing IAQ issues in schools, the Department of Health created the "School Indoor Air Quality Best Management Practices Manual" in 1995. See http://www.doh.wa.gov/ehp/ts/School/SchoolAirBMP.pdf (last visited Jan 4, 2002). The Department received funding for the project from the state Superintendent of Public Instruction. The manual focuses particular attention on new construction but also addresses existing schools.

The 175-page manual is not a step-by-step technical document but does provide in-depth discussion of all aspects of IAQ-related maintenance activities, as well as a discussion of the basic elements of good IAQ planning and management. The key sections addressing existing schools cover: operating and maintaining HVAC systems; controlling contaminant sources; and IAQ planning and management. The manual includes a discussion of practices that are required by law, as well as those that are recommended by the agency as best management practices. In an introduction to the document, the agency states that "all users of the Manual, including school districts, should evaluate the discretionary recommendations presented in this Manual, and adopt or promote those which, in their judgment, are relevant and applicable to their circumstances, and feasible to implement."

Observations: Washington's Best Practices Manual has played a central role in improving understanding of good IAQ practices in schools. While the manual has a primary focus on new construction, it also has been used to improved maintenance practices. As noted earlier, the state Department of Health has incorporated the manual as voluntary guidelines in the agency's checklist of school health and sanitary standards.

EXAMPLE ⇨ MINNESOTA

Summary of Policy: State education law requires the state to develop and disseminate a number of manuals and other informational resources.

Policy: Mn. House File No.1 (Section 26, Subdivision 1).

This law requires the state Department of Children, Families and Learning to develop a school IAQ maintenance manual, as well as a manual for IAQ in school construction. The law specifies various types of information that must be included in the manuals, including training needs and maintenance practices that are required to ensure good IAQ.

Observations: The department has completed the maintenance publication, titled "Indoor Air Quality Operations and Maintenance Manual," containing detailed

information on operations and maintenance practices in the areas of administration, mechanical ventilation, building envelope and housekeeping. The manual includes checklists that can be used by school officials and also discusses the components of a baseline IAQ evaluation. In addition to the manual, the CFL has produced for the public a widely-circulated flier titled "Indoor Air Quality: An Issue For Parents, Employees and Building Occupants."

EXAMPLE ⇨ NEW JERSEY

Summary of Policy: Labor law directs state labor agency to provide technical assistance on health and safety issues covered by the law.

Policy: N.J. Stat. § 34:6A-31.

This state labor law requires the state to publish and disseminate to employers and employees "informational, educational and training materials" to aid in achieving the goals of the law.

Observations: The state has implemented this general requirement by publishing a number of guidance documents relating to indoor air quality in schools. In order to assist schools in carrying out the requirements of the state's occupational health and safety regulations (see Part B.1, above), the Department of Health and Senior Services has published a document titled "Indoor Air Quality Model Program," which includes information on state regulatory requirements, a discussion of how to maintain good indoor air quality (including forms and worksheets), and a list of resources for schools on the subject. See http://www.state.nj.us/health/eoh/peoshweb/iaq.pdf (last visited Jan 4, 2002). The agency's other IAQ-related publications include "Indoor Bioaerosols" (1997), which presents general information on health effects, identification and control of bioaerosols, and emphasizes preventive maintenance practices. See http://www.state.nj.us/health/oh/peoshweb/bioaero.htm (last visited Jan 4, 2002). The agency has also worked to educate school districts on EPA's Tools for Schools program and to work with schools to implement the program.

EXAMPLE ⇨ WEST VIRGINIA

Summary of Policy: State education law and rules provide for technical assistance to schools on HVAC problems.

Policy: W.Va. Code §§ 18-9E-3,4,5; W.Va. Leg. Rules, 126-175.

West Virginia's law governing indoor air quality in schools, enacted in 1999, authorizes the state Board of Education to hire HVAC technicians to assist schools in preventing and addressing HVAC problems, using funds allocated through the legislation. The rules adopted to implement the act reiterate the requirement that technicians are to provide technical assistance and training to county and school maintenance personnel as needed.

Observations: This policy is unusual in that it not only directs the state education agency to provide technical assistance to schools on HVAC issues, but also provides for the development of state technical expertise on the subject. The state has hired technicians, who have begun to work with local school districts. Among the challenges faced by the state in implementing this policy is ensuring that local school districts take action to address any HVAC problems that are identified.

3. Providing Schools With Funding and Financial Incentives

One of the key obstacles to promoting good IAQ maintenance practices is the financial cost to local school districts of carrying out the work. Preventive maintenance and timely repairs can produce both financial benefits from the avoided cost associated with IAQ problems and productivity benefits from better indoor air quality, yet competition for educational resources remains a significant obstacle to changing behavior in this area. While this report does not examine state funding of school maintenance and repairs, the following are some examples of policies that either provide funding for IAQ-related maintenance and repair projects or establish financial incentives for school districts to undertake maintenance activities.

State	Law/Regulation	Brief Description
Minnesota	Minn. Stat. § 123B.57	State educational law providing for state funding to schools for capital expenditures on health and safety projects, including indoor air quality projects.
Maine	Me. Rev. Stat. tit. 30-A, § 6006-F	State educational law establishing a state fund for school repairs and renovations.
New York	N.Y. Educ. Law § 3641(4)	State education law providing for state aid to conduct state-mandated building condition survey.
Maine	Me. Rev. Stat. tit. 20-A, § 15905	Education law requires a facility maintenance plan as a condition of receiving state school construction funding
Massachusetts	Mass. Gen. Laws ch.70B, § 8; Code Mass. Regs. tit. 603, § 38.14.	Education law and regulations condition state construction funding on minimum levels of maintenance spending.
Alaska	Alaska Stat. §§ 14.11.011, 14.11.013.	Education law requiring school districts to implement a preventive maintenance plan in order to receive funding for construction and repairs and giving funding priority to districts with higher maintenance spending.

EXAMPLE ⇨ MINNESOTA

Summary of Policy: State education law provides state funding to schools for capital expenditures on health and safety projects, including indoor air quality projects.

Policy: Minn. Stat. § 123B.57.

Minnesota law establishes a "Capital Expenditure: Health and Safety" program that provides revenue to schools for health and safety repairs. Under the program, school districts submit an application to the state education agency each year with a total revenue request for such projects. Of the amount approved by the state, a portion is provided in state aid, and the school district is permitted to levy the remaining amount. If the district fails to levy the entire amount permitted, state aid is reduced proportionately. State aid is equalized, with the state providing approximately 15 percent overall. The program specifically authorizes requests for projects to address IAQ issues in existing school facilities, provided that a health or safety issue is identified.

Observations: Minnesota's Capital Expenditure: Health and Safety program has been a significant resource for assisting schools in addressing the causes of indoor air quality problems, for example, through upgrading or repairing HVAC systems or removing contaminated building components and furnishings. According to state officials, IAQ projects accounted for $20-30 million of the total $92 million in state-approved projects in fiscal year 2001, representing the single largest category of requested aid.

The state education agency also contracts with service providers to provide school districts with management assistance, pursuant to the law. The agency has a contract with nine service cooperatives throughout the state. Each cooperative has a health and safety management professional who assists the school districts in that region with identifying and prioritizing hazards and developing plans to correct them. Under this arrangement, the management professionals are required to conduct a walk-through of each school facility at least once during the year and to write a report of the deficiencies noted. These reports, along with the plans to correct the deficiencies, are required in applications for state health and safety revenue.

As discussed in Part B.1, in order to receive state funds, school districts must develop an IAQ management plan. Thus, while providing funds for capital projects, the law seeks to ensure attention to ongoing preventive maintenance practices.

EXAMPLE ⇨ MAINE

Summary of Policy: Law establishes a state fund for school repairs and renovations.

Policy: Me. Rev. Stat. tit. 30-A, § 6006-F.

Maine law establishes the School Revolving Renovation Fund, which provides financial assistance to school administrative units for school repair and renovation. The Fund provides zero-interest loans with varying pay-back periods, as well as grants in the form of forgiveness of principal payments on the loans. In order to be eligible to receive funds under the program, a project must be on a priority list developed by the Department of Education. In developing the priority list, the department is required to give special consideration to projects that include "urgent health and safety needs." The law specifically establishes improving air quality in a school building as one of several areas with "first priority status" for receiving funds. Although the Fund is administered by the Maine Municipal Bonds Bank, the Commissioner of Education is authorized to

receive revenue from the fund, and any such revenue must be deposited in a dedicated account for carrying out the purposes of the legislation.

Observations: The School Revolving Renovation Fund has served as an important resource for school repair and renovation activities. According to officials, the state has put $100 million dollars into the Fund since it was established in 1997, and 80-90 percent of the money disbursed under the program has been earmarked for IAQ problems – generally moisture-related problems or air exchange problems. As discussed in Part B.1, applicants for funding must submit their maintenance plan for the facilities; thus, the policy seeks to ensure attention to preventive maintenance practices at any facility that receives funding for major repairs.

EXAMPLE ⇨ NEW YORK

Summary of Policy: State education law provides for state aid to conduct state-mandated building condition survey.

Policy: N.Y. Educ. Law § 3641(4).

This law, which establishes a requirement that schools conduct five-year building condition surveys, authorizes financial aid for schools to conduct the surveys. The state is also authorized to enter into state-wide contracts with architects and engineers to provide building condition surveys on a regional basis for a fixed fee per square foot. The legislation states that because the state's existing aid formula does not provide for local assistance for building condition surveys, additional funding is necessary to assist local public school districts.

Observations: In addition to addressing all major building systems, the state law specifically requires that five-year building surveys include a number of indoor environmental features. The survey is a central component in the state's approach to ensuring that school buildings are maintained in good condition. By providing financial aid for conducting the surveys, the policy seeks to avoid a likely obstacle to local implementation.

EXAMPLE ⇨ MAINE

Summary of Policy: Education law requires a facility maintenance plan as a condition of receiving state school construction funding.

Policy: Me. Rev. Stat. tit. 20-A, § 15905.

This law provides that the state must require school districts applying for school construction funding to establish a facility maintenance plan for the life of the proposed building. The state is to provide technical assistance to schools, including a model facility maintenance plan, in carrying out this requirement.

Observations: This law uses school construction funding as a financial incentive for school districts to put in place a maintenance plan for newly built facilities. While the law does not specify the components of the plan, it does require the state to develop a model maintenance plan and to assist schools in establishing their plans. As discussed in Part B.1, another law requires all schools to have a maintenance program and the state education agency is required to prepare a maintenance template that schools can use. This policy provides an additional mechanism for ensuring that schools put the required plans in place.

EXAMPLE ⇨ MASSACHUSETTS

Summary of Policy: Education law and regulations require that school districts spend a minimum percentage of the funds that have been allocated for ordinary and extraordinary maintenance, in order to receive state school construction funding.

Policy: Mass. Gen. Laws ch.70B, § 8; Code Mass. Regs. tit. 603, § 38.14.

As discussed in Part B.1, this law and regulation require that schools meet minimum spending levels for ordinary and extraordinary maintenance, in order to receive state funding for school construction and emergency repairs. The regulation further provides for suspending state payments if a school district fails to remain in compliance with the requirement.

Observations: This policy uses the financial incentive of state construction funding to ensure that a minimum percentage of the funds allocated for maintenance in a given year is in fact used for that purpose.

EXAMPLE ⇨ ALASKA

Summary: Education law requiring school districts to implement a preventive maintenance plan in order to receive funding for construction or major repairs, and giving priority to districts with higher levels of maintenance expenditures.

Policy: Alaska Stat. §§ 14.11.011, 14.11.013.

This education law establishes funding programs for school construction and major repairs, and requires that school districts applying for grants submit evidence that they have developed a preventive maintenance plan and are implementing that plan. Another part of the school education code sets forth the general requirement that school boards are responsible for developing and implementing such a plan. (Alaska Stat. §§ 14.14.090, 14.08.111) The law further provides that in reviewing grant applications, the state education agency must prioritize funding projects based on a number of factors, including "the amount of district operating funds expended for maintenance."

Observations: This policy uses the state's construction and repair funding programs to provide a financial incentive for compliance with the state requirement that school districts develop and implement a preventive maintenance plan. The state education agency has developed a handbook on preventive maintenance that does not address IAQ issues specifically, but does discuss how to develop and implement a preventive maintenance plan generally. The handbook includes a recommendation that schools set aside five percent of the present value of the building for preventive maintenance. The handbook also notes that the scoring system for the state capital improvement funding program gives increased points based on the "percentage of total maintenance expenditures relative to the building replacement value(s)," with maximum points for five percent or more. State of Alaska Department of Education & Early Development, "Preventive Maintenance Handbook" at 8 (1999), *available at* http://www.eed.state.ak.us/facilities/publications/PreventiveMaintenance.pdf (last visited Jan. 9, 2002).

4. Strengthening the Public Right to Know About Indoor Air Quality in Schools

The public plays an important role in helping to ensure compliance with key environmental, health, consumer protection and other laws. One strategy for ensuring that schools take action to prevent and control indoor air quality problems is to provide the public with information to hold schools accountable for carrying out their responsibilities to maintain healthy indoor environmental quality in schools.

Following are some examples of state policies relating to IAQ in schools that specifically include public right to know provisions. In addition to such policies, many states have public records laws that mandate public access to governmental information. Those laws may enable citizens to gain access to school information that is reported to state agencies, or to gain direct access documents maintained by school districts.

State	Law/Regulation	Brief Description
New York	Regents Statement of Principles; N.Y. Educ. Law §§ 409-d, 409-e; N.Y. Code R. & Regs. tit. 8, §§ 155.3, 155.4, 155.6	State Board of Education establishing right to know principle, and education law and regulations providing for access to information about school facilities.
New Jersey	N.J. Admin. Code tit. 12, § 100-13	State labor regulations requiring retention of maintenance records and employee access to the records.
California	Cal. Code Regs. tit. 8, §§ 1542, 1543	Labor regulations requiring retention of maintenance records and employee access to the records.
California	Cal. Educ. Code §§ 17584, 17584.1	Education law requiring public dissemination of information regarding budgeting and planning for deferred maintenance projects.

EXAMPLE ⇨ NEW YORK

Summary of Policy: State Board of Education establishes right to know principle, and education law and regulations provide for access to information about school facilities.

Policies: Regents Statement of Principles; N.Y. Educ. Law §§ 409-d, 409-e; N.Y. Code R. & Regs. tit. 8, §§ 155.3, 155.4, 155.6.

In 1994, the New York State Board of Regents adopted guiding principles for improving the environmental quality of schools. In addition to stating that "every child has a right to an environmentally safe and healthy learning environment which is clean and in good repair," the principles provide that "every child, parent, and school employee has a 'right to know' about environmental health issues and hazards in their school environment."

The state education law and regulations contain some provisions that build on the right to know principles established by the Board of Regents. As discussed earlier,

the school health and safety program created by the state education code and implementing regulations requires the development of a maintenance plan, as well as comprehensive school inspections. The law and regulations provide that the maintenance plan and the inspection reports, along with records of complaint investigations, must be made available to the public on request. The state health and safety policy also requires school districts to prepare annual "school facility report cards," and school boards must report at a public meeting on each element included in the school facility report cards.

In addition to providing for access to these facility documents, the law and regulations provide for public participation in a school's health and safety activities by mandating the establishment of a health and safety committee at the school district level consisting of representation from district officials, staff bargaining units and parents.

Observations: New York's law and regulations provide for community access to a number of different documents describing the condition of school facilities and school maintenance practices. Whether this information is used will depend on many factors, including the extent to which the public is informed that the information exists. The law and regulations do not establish a general affirmative duty on the part of school officials to notify the public of the existence of the documents. One notable exception are the provisions governing school facility report cards, which mandate dissemination through public hearings. This is also potentially significant because the report cards must include "the status of measures taken to assure acceptable indoor air quality."

The Department of Education has developed a guidance document for school districts on establishing a health and safety committee. Stating that the duties of the health and safety committee "should be as broad as possible," the guidance outlines the key functions of the committees, including monitoring construction and maintenance projects and tracking complaints and responses. The document states that districts should conduct outreach to staff, unions and parents to recruit members of the committee, and also suggests the formation of committees both at the building level and district wide.

EXAMPLE ⇨ NEW JERSEY

Summary of Policy: Labor regulations require retention of maintenance records and employee access to the records.

Policy: N.J. Admin. Code tit.12, §100-13.

Under the state's occupational health and safety regulations discussed in Part B.1, employers (schools) must retain maintenance records for three years and make the records available to employees.

Observations: By requiring schools to retain maintenance records, these regulations establish one mechanism for public accountability in addressing basic indoor air quality issues.

EXAMPLE ⇨ CALIFORNIA

Summary of Policy: Labor regulations require retention of maintenance records and employee access to the records.

Policy: Cal. Code Regs. tit. 8, §§ 1542, 1543.

These occupational safety and health regulations, discussed in Part B.1, also require that employers retain maintenance records and make them available to employees upon request.

Observations: This requirement differs somewhat from the New Jersey labor regulations discussed above, in that the records must be maintained for five years and must be made available for inspection and copying within 48 hours of a request. In addition, the records must be provided to employees *or* their designated representative; this provision potentially allows affected parties other than employees to review the records, provided they have been designated by the employee as a representative.

EXAMPLE ⇨ CALIFORNIA

Summary of Policy: Education law requires public dissemination of information regarding budgeting and planning for deferred maintenance projects.

Policy: Cal. Educ. Code §§ 17584,17584.1.

This law, described in Part B.1, requires schools to budget a certain amount for deferred maintenance in order to receive state matching funds. The law explicitly states that its purpose is to "inform the public regarding the local decision-making process relating to the deferred maintenance of school facilities, and to provide a foundation for local accountability in that regard." Toward this end, the law requires that schools failing to meet the minimum budget formula must justify their actions and make this information available to the public. Moreover, school districts are required to discuss their plans to expend funds from the deferred maintenance fund at a regularly scheduled public hearing.

Observations: This law uses public participation and access to information as the primary tool for changing behavior – in this case, aiming to ensure that schools establish adequate budgets for deferred maintenance projects by drawing public attention to a school district's failure to obtain available state funding. Rather than simply requiring public access to written information, the law establishes an affirmative duty on the part of school districts to discuss plans for deferred maintenance projects at a regularly scheduled public meeting. The policy is not specific to indoor air quality, but it encompasses IAQ-related deferred maintenance projects.

Part C

INDOOR AIR QUALITY IN NEW AND RENOVATED SCHOOLS

State Policy Approaches to Promoting Better Design and Construction Practices

According to a 1999 U.S. Department of Education estimate, two new K-12 schools are started each business day in the United States, for a total annual cost of approximately $16 billion. See U.S. Dep't of Education, "K-12 School Construction Facts" (May 1999), *available at* http://www.ed.gov/inits/construction/k12-facts.html. A recent study estimated the costs for repair and replacement of schools based on infrastructure needs at approximately $268 billion. National Education Association, "Modernizing Our Schools: What Will It Cost?" at 22 (2001). In addition, court-mandated school construction programs are being created to address inequities in school funding formulas. States such as Ohio and New Jersey have recently developed school construction programs that seek to address such historic imbalances in resources and facilities in school districts.

The amount of school construction activity that will occur in the coming years creates a tremendous opportunity to change the way we build schools across the United States – to prevent pollution, promote health and create places of inspiration for children and the larger school community. Yet for the most part, indoor air quality is not a prominent consideration in the design and construction of schools in the United States.

Many newer schools have had indoor air quality problems resulting in serious health, productivity and financial impacts. Greater attention to key IAQ-related aspects of building design and construction (for example, mechanical systems, building shell features, low-emitting materials and IAQ management during construction) can help prevent indoor air quality problems from developing in the first place. In addition, the portable classrooms used widely to address overcrowding can create significant indoor environmental quality problems of their own – in particular, poor ventilation, water intrusion, and chemical off-gassing – if not built properly.

States have a potentially significant role in improving the way schools are built, since most states provide funding for local school construction and require state approval at various stages of design and construction. *See generally*, National Governors Association, "Building America's Schools: State Efforts to Address School Facility Needs" (June, 2000); U.S. General Accounting Office, "School Facilities: Construction Expenditures Have Grown Significantly in Recent Years" (March 2000). States can also serve an educational and training function in this process.

This Part discusses in detail existing state policies for ensuring that schools are designed and constructed with good indoor air quality in mind. These policies are grouped into the following three general approaches:

(1) Traditional regulatory requirements;
(2) Information and training; and
(3) Public right to know.

This Part does not contain a separate section on state policies that incorporate funding and financial incentives to promote

healthy school construction, however, most of the regulatory approaches that are discussed here have been adopted in the context of state school construction funding programs. In addition to general school construction programs, some states have provided funding for pilot "high performance" school construction projects. For example, Pennsylvania's Department of Environmental Protection has provided funding to support the High Performance Schools Partnership Project, which is developing pilot schools that are both "green and healthy." See http://www.dep.state.pa.us/dep/deputate/pollprev/p2_features/hpsp.htm (last visited Jan. 7, 2002). In addition, the California Energy Commission has provided grants to help build two model high performance schools. See http://38.144.192.166/releases/2001_releases/2001-09-14_newsrelease.html (last visited Jan. 7, 2002). These programs have been created independent of state law or regulation and are not included here.

1. Establishing Traditional Regulatory Requirements: Standards and Required Practices in Design and Construction

School construction is generally required to conform to a state or local building code that contains some requirements relating to indoor air quality, for example, with respect to mechanical systems. This section does not provide a review of these state building code provisions, but rather discusses examples of state education, health and labor policies that address indoor air quality issues directly or indirectly. Most common among these are education laws and regulations, which establish minimum design and construction standards in conjunction with the state school construction funding program.

These policies seek to ensure good indoor air quality by setting requirements in the following four key areas: IAQ management practices during construction and renovation; ventilation; materials and furnishings; and commissioning.

This Part does not include requirements relating to siting of school facilities. Facility siting can have important implications for the indoor environment. For example, hazardous materials located on the site can be released or drawn into the school building. Many states have laws that address the siting of school facilities on contaminated land, and these issues have been the subject of other publications. See, for example, Child Proofing Our Communities Campaign, "Creating Safe Learning Zones: Invisible Threats, Visible Actions" (2002), *available at* http://www.childproofing.org/cslzindex.html.

State	Law/Regulation	Brief Description
Minnesota	Minn. Stat. §§ 123B.71, 123B.72	State education law establishing ventilation and commissioning requirements for new school construction projects and establishing a state review process.
New York	N.Y. Educ. Law §§ 408, 409e; N.Y. Code R. & Regs. tit. 8, §§ 155.1 (b)(3), 155.2(b)(1), 155.5	State education law and regulations establishing various requirements applicable to new school construction projects.
West Virginia	W.Va. Code § 18-9E-3, 4, 5; W.Va. Code St. R. tit. 126 §§ 173, 175	State education law and rules establishing new construction requirements relating to ventilation, material selection and radon.
Massachusetts	Code Mass. Regs. tit. 603, § 38.03	State education regulation establishing requirements relating to IAQ management during construction.
New Jersey	N.J. Admin. Code tit. 12, § 100-13.5	State labor regulation establishing requirements for construction of occupied schools and for materials selection.
Washington	Wash. Admin. Code § 246-366	State health regulations establishing minimum environmental standards for newly constructed schools and requiring local health department review and approval of plans and specifications, as well as pre-occupancy inspection.

EXAMPLE ⇨ MINNESOTA

Summary of Policy: State education law establishes ventilation and commissioning requirements for new school construction projects and establishes a state review process.

Policy: Minn. Stat. §§ 123B.71, 123B.72.

This law establishes certain state approval requirements for school renovation and construction projects. For projects over $250,000, the school must consult with the state prior to developing plans and specifications, and the state is required to provide the school with information on indoor air quality. As part of the consultation process, the law sets out certain items that must be submitted to the state, although the state may require that the school submit additional information for approval. For projects that will exceed $500,000 the school must go through a state review and comment process, which includes a demonstration by the school that "IAQ has been considered" during this process. The school may not conduct a referendum for bonds, solicit bids or use state capital facility revenue without going through the review and comment process; however, the law gives the state discretion to issue an exemption to a facility maintenance project.

Ventilation. Minnesota's law specifically requires, as part of the consultation process, that the school submit information to the state showing that the HVAC system will at least meet the current code, and that the design will allow for monitoring of outdoor air flow and total air flow. Recently, the state legislature added a requirement that prior to occupying a school after an HVAC installation or retrofit project subject to the state review and comment process, the school must demonstrate that it uses a filtration system meeting the current

ASHRAE (American Society of Heating, Refrigeration and Air-Conditioning Engineers, Inc.) standard.

Commissioning. A related requirement of the law is that prior to occupying a school after an HVAC installation or retrofit project subject to the state review and comment process, the school must document commissioning of the system to show that it meets the ventilation standards described above. Schools must submit the documentation to the local building code official or, if there is none, to the state education agency and the state building code office. If the system does not meet the standards, the code official or commissioner of education may allow occupancy for up to one year while the system is improved.

Observations: The state has prepared a checklist of items that must be submitted to the state during the review and comment process, including certification that the specific HVAC requirements have been met. According to state officials, the state requires the architect to sign off on these HVAC items at the outset of the project.

EXAMPLE ⇨ NEW YORK

Summary of Policy: State education law and regulations establish various requirements applicable to new school construction projects.

Policy: N.Y. Educ. Law §§ 408, 409e; N.Y. Code R. & Regs. tit. 8, §§ 155.1(b)(3), 155.2(b)(1), 155.5.

In New York, the Department of Education serves as the building department for public schools, other than those in New York City. The agency issues building permits and certificates of occupancy, which are necessary in order for a school to receive state aid.

According to state law and regulations, plans and specifications for building projects must be submitted to the Department of Education for projects costing at least $10,000, as well as for any project affecting the health and safety of students. Upon approval of plans and specifications, the commissioner issues a building permit. Once a permit is issued, it may be revoked if there is a violation of the state fire prevention and building code or of any other state safety standard. (As noted in Part B.1, a school's certificate of occupancy must be reissued annually and is based on a satisfactory fire and building code inspection report.)

In addition to the state law and regulations, the Department of Education has developed a Manual of Planning Standards describing in detail all aspects of school construction. See http://edlink.nysed.gov/facplan/Publicat/mps1998.pdf (last visited: Jan. 7, 2002). The manual, originally published in 1965 and updated in 1998, includes both minimum requirements and recommended practices. The requirements incorporated into the manual reflect, and in some cases expand on, existing requirements in the law and regulations.

IAQ Management During Construction/Renovation. State law requires the Department of Education to develop a monitoring system for the safety of public schools, including the establishment of uniform safety standards governing all construction projects. The agency has promulgated regulations setting forth standards to ensure the safety of building occupants during construction. Among the requirements included in the standards are: preventing the passage of dust and contaminants to occupied parts of the building; maintaining ventilation during

construction; ensuring noise abatement; controlling chemical fumes, gases and other contaminants; and involving the school health and safety committees in monitoring safety during construction.

Ventilation. The school facilities regulations provide that new school construction must comply with the state building code (N.Y. Code R. & Regs. tit. 9, §§ 600-1250), which requires that mechanical systems meet ASHRAE standards. The school facilities regulations also require generally that each teaching space be provided with "a controlled supply of fresh air and shall have sufficient air changes to produce healthful conditions and avoid odors or build-up or concentrations of toxic substances or dust particles."

The minimum fresh air requirement is reiterated in the agency's Manual of Planning Standards. The manual further prohibits placement of air intakes adjacent to school bus loading areas, loading docks or air exhaust vents. (Manual at 76.)

Materials and Furnishings. The school facilities regulations prohibit "materials, equipment, and types of construction which may endanger the health, safety and comfort of occupants." The regulations further specify procedures for off-gassing of volatile organic compounds (VOCs) introduced during construction projects:

> The bid specifications shall require schedules of work on construction and maintenance projects which include time for 'off-gassing' of volatile organic compounds introduced during construction before occupancy is allowed. Specific attention is warranted for activities including glues, paint, furniture, carpeting, wall coverings, and drapery. Manufacturers shall be contacted to obtain information regarding appropriate temperatures and times needed to cure or ventilate the product during use and before safe occupancy of a space can be assured. Building materials or furnishings which 'off-gas' chemical fumes, gases, or other contaminants shall be aired out in a well-ventilated, heated warehouse before it is brought to the project for installation or the manufacturer's recommended 'off-gassing' periods must be scheduled between installation and use of the space. If the work will generate toxic gases that cannot be contained in an isolated area, the work must be done when school classes and programs are not in session. The building must be properly ventilated and the material must be given proper time to cure or "off-gas" before re-occupancy.

N.Y. Code R. & Regs. tit. 8, § 155.5(j)(1).

Observations: According to state officials, the state has experienced school closings due to contractors' failure to maintain adequate separation between construction work and occupied spaces. Thus, the requirements for IAQ management during construction are particularly important, and the state has prepared a "code compliance checklist" form to ensure that the rules are followed. See http://www.emsc.nysed.gov/facplan/SubInfo.htm (last visited Jan. 7, 2002). The form, which must be submitted to the state in connection with all new projects, includes a list of each requirement along with a space for the school to indicate the page

number on which the items appear in the contract documents for the project. In addition to this document, the agency has created a separate checklist of items relating to IAQ management during construction that must appear in contract documents. The Manual of Planning Standards also contains a separate appendix emphasizing the requirements for taking the proper precautions during construction projects in occupied buildings, including the requirement that such precautions be specified in the contract documents.

The code compliance checklist form also includes a check-off of the following ventilation requirements: (1) 15 cubic feet/minute of fresh air in classrooms; (2) "ASHRAE 62" requirements; and (3) "sequence of operation."

The Manual of Planning Standards expands on the regulations governing materials selection and indoor air quality issues. The manual provides generally that "materials shall be selected and specified with the specific goal of promoting health and safety of building occupants. Consideration must be given to choose material proven to have low emissions of volatile organic compounds and limited production of particulate matter over their projected life cycle." (Manual at 27). The manual also provides that schools must exercise caution in selecting carpeting and floor coverings, "with consideration and guarantees from the manufacturers regarding limitation and control of. . . microbial growth, outgassing, (and) cleanability" of the carpet or floor covering as well as the backing and adhesives. (Manual at 37). The manual further recommends: airing out the carpeting two to three months in advance; allowing for a 30-day cook-out period before occupancy; using adhesives sparingly; using low-odor, low-solvent adhesives for applying the floor covering; and allowing at least 48 hours before re-occupancy. (Manual at 37).

Together, the regulations and the manual cover substantial ground in addressing materials selection and IAQ issues. It is difficult to ascertain the extent to which these provisions – a combination of contract document requirements, required practices, and considerations for taking action – have resulted in changes in school practices. There does not appear to be a formal mechanism in place for oversight into how most of the specified practices are implemented by schools.

EXAMPLE ⇨ WEST VIRGINIA

Summary of Policy: State education law and rules establish new construction requirements relating to ventilation, material selection and radon.

Policy: W.Va. Code §18-9E-3,4,5; W. Va. Code St. R. tit. 127, §§ 173,175.

West Virginia provides funding for school construction, and schools must submit all new designs to the state for review and approval prior to preparation of final bid documents. According to state officials, the School Building Authority reviews schematics, design development plans and bid documents. In addition to the two issues discussed below, the indoor air quality law focuses particularly on radon, mandating that new schools be tested for radon within one year of occupancy and at least every five years thereafter. The law requires that unacceptably high levels be mitigated and directs the School Building Authority to promulgate rules establishing acceptable radon levels.

Ventilation. The state education law establishes ventilation standards for new schools. According to the statute, any new

school built by a county board of education, regardless of the funding source, must be designed and constructed in compliance with current ASHRAE standards, as well as the BOCA (Building Officials Code Administrators International) building code.

Materials/Furnishings. As noted in Part B.1, the statute directs the state to promulgate rules that authorize schools to use any appropriate floor covering based on user needs and performance specifications. The rule adopted by the board "highly recommends" that carpeting be restricted to certain types of rooms in the school, and requires that carpet used in existing or new schools meet industry standards, including those for off-gassing and reducing microbial growth. The rule also requires that schools proposing to use or replace carpeting provide the state with documentation that the use will "enhance the effectiveness of the teaching environment."

Observations: Prior to the establishment of this law, new schools were not required to meet ASHRAE ventilation standards, including those for minimum fresh air intake. In addition to addressing minimum fresh air requirements, the state has taken significant steps to encourage schools to consider carefully the circumstances in which they use carpeting and to select carpeting that will minimize IAQ problems. By requiring schools to provide justification for the use of carpeting, the state has established a mechanism for evaluating whether such use is appropriate and for ensuring that selection and installation of the carpeting comply with the rules.

EXAMPLE ⇨ MASSACHUSETTS

Summary of Policy: State education regulation establishes requirements relating to IAQ management during construction.

Policy: Mass. Regs. Code tit. 603, § 38.03(13).

IAQ Management During Construction/Renovation. These regulations governing the school building program were adopted pursuant to the general authority of the state Board of Education to promulgate regulations implementing the state education law. The regulations establish requirements that must be met by all capital construction projects seeking school building assistance grants from the state. The regulations were promulgated to "assure that the Commonwealth's interests in funding public school construction are safeguarded and ensure maximum attention to the cost effects of the program and design decisions and material and systems selections. . . ." Projects undertaken while a building is occupied must implement containment procedures for pollutants created during the construction process. The procedures must be consistent with the "IAQ Guidelines for Occupied Buildings Under Construction," published by the Sheet Metal and Air Conditioning Contractors National Association, Inc. (SMACNA).

Observations: These regulations require compliance with current industry standards for addressing indoor air quality during school construction where the building is occupied. The requirement has broad applicability, as it is a condition of receiving state financial assistance for school construction projects. Moreover, the regulation establishes a mechanism for ensuring compliance by requiring that all bids include the cost of

planning and carrying out the containment measures.

EXAMPLE ⇨ NEW JERSEY

Summary of Policy: State labor regulation establishes requirements for IAQ management during construction and for material selection.

Policy: N.J. Admin. Code tit.12, §100-13.5.

IAQ Management During Construction/Renovation. This labor regulation, in addition to providing the maintenance-related requirements discussed in Part B.1, requires local ventilation during renovation or remodeling of buildings if the work produces dust, particles, toxic gases or other harmful substances in quantities that are hazardous to health. The regulation also specifically provides that work in occupied areas must be isolated, with dust and debris confined to the work area.

Materials and Furnishings. The regulation provides that before using paints, adhesives, sealants, solvents, and other materials in construction, the employer must check product labels or obtain information from the manufacturers on whether the materials contain VOCs that could be emitted during regular use. Moreover, the regulation states that this information *shall* be used in selecting products.

Observations: These requirements are enforced through the traditional mechanisms for investigating and citing violations of occupational safety and health standards, as discussed earlier. Thus, if the state health department receives a complaint from a school employee stemming from construction practices, the department could conduct an inspection and issue a citation requiring a schedule for correcting the problem. With respect to the materials selection requirements, the school might have to demonstrate that it considered VOC content, but the regulation does not require or prohibit certain materials nor mandate specific practices. A stronger basis for the state to require a school to correct a problem is the requirement for local ventilation of gases or other pollutants.

As noted earlier, in addition to this regulatory role, the agency serves an education function on occupational health and safety issues, including indoor air quality. With respect to new construction, the health department has published a document titled "PEOSH [Public Employees Occupational Safety and Health] Policy on Building Renovation." The document reiterates the regulatory requirements relating to indoor air quality and describes methods for minimizing health hazards. The publication also addresses the subject of carpeting, which is not specifically covered in the regulations. The document describes the potential IAQ impacts from carpet installation and provides tips on reducing potential health hazards, including: limiting the use of carpeting in the workplace, never using carpeting where persistent moisture may be present, airing out carpeting prior to installation, vacuuming old carpeting prior to removal, relocating workers during installation, isolating and ventilating the work area, keeping the carpet clean and dry, and using the least volatile adhesive. See http://www.state.nj.us/health/eoh/peoshweb/bldgreno.htm.

EXAMPLE ⇨ WASHINGTON

Summary of Policy: State health regulations establish minimum environmental standards for newly constructed schools and require local health department review and

approval of plans and specifications, as well as a preoccupancy inspection.

Policy: Wash. Admin. Code § 246-366.

The school inspection program within the state Department of Health, described in Part B.1, also contains requirements relating to newly constructed schools. The regulations mandate that, prior to construction of a new facility, a local board of education must submit final plans and specifications to the local health department and must obtain both the agency's recommendations and written approval that the plans meet the state's minimum environmental standards. As discussed previously, the standards most relevant to indoor air quality include requirements that buildings be kept clean and in good repair, that floors have easily cleanable surfaces, that there be local exhaust for air pollutant sources, and that rooms be kept reasonably free of objectionable odor, excessive heat and condensation. Following construction, the local health department is directed to conduct a preoccupancy inspection to determine that the school conforms with the approved plans and specifications. The regulations were promulgated pursuant to state law (Wash. Rev. Code § 43.20.050) providing the state health department with general authority to adopt rules controlling public health related to environmental conditions in all types of public facilities.

Observations: This policy provides local health departments with considerable authority to review new school construction plans and ensure that the school is built according to the plans, although the regulations do not specify consequences for an unsatisfactory preoccupancy inspection. While the state's minimum environmental standards are general, the regulations do provide authority for ensuring that various elements of the plans and specifications – for example, the HVAC system – will enable the school to meet those standards. As noted earlier, the general nature of the standards makes it less likely that their application will be consistent across the state. Local health departments vary considerably in the extent of their involvement in IAQ and other school environmental issues, due largely to resource constraints.

2. Providing Information and Training on Good IAQ Design and Construction Practices

Achieving good indoor air quality in new schools, as in existing schools, depends in part on the education and training of those who are responsible for making design and construction decisions. States have a significant role to play in providing such information and technical assistance. While formal state legislation or regulations may not be necessary to create valuable educational resources or provide technical assistance, state policy can be important in strengthening the state's role in this area.

Many states have school construction manuals. This section describes some state manuals and guidance documents that focus exclusively or significantly on IAQ issues, as well as the laws or regulations that gave rise to the publications. This section also describes one state's efforts to develop a public/private partnership to educate school and design professionals on how to create "high performance" schools.

While this report focuses on IAQ in schools, state policies that lead to the development of IAQ guidance in other areas may also be useful in the schools context. For example, a 1990 California law required the state to develop non-binding guidelines on

reducing exposures to VOCs from construction materials used in office buildings. See California Health & Safety Code 426.10. The resulting guidance document can also help guide school efforts to reduce VOC exposures resulting from construction materials, construction products, and major furnishings. See California Department of Health Services, "Reducing Occupant Exposure to Volatile Organic Compounds (VOCs) From Office Building Construction Materials: Non-Binding Guidelines" (1996), *available at* http://www.cal-iaq.org/VOC/VOC.html (last visited Jan. 4, 2002).

State	Law/Regulation	Brief Description
Texas	Tex. Health & Safety Code § 385; 25 Tex. Admin. Code § 297.1-.6	State law mandating creation of voluntary guidelines for IAQ in schools, and regulations promulgating guidelines.
Washington	Wash. Rev. Code § 70.162.	State law providing for development of best management practices, and state-created manual describing required practices as well as recommendations for addressing IAQ in schools.
Minnesota	Mn. House File No. 1 (§26, Subdivision 1)	State education law requiring the state to develop and disseminate a number of manuals and other informational resources.
New York	New York State Department of Education, Manual of Planning Standards.	State-created manual describing both required and recommended practices and procedures for school design and construction, including IAQ practices.
California	California "Collaborative for High Performance Schools (CHPS)" initiative	Collaborative effort including several state agencies to develop information, technical assistance and training on school construction that promotes indoor and outdoor environmental quality.

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EXAMPLE ⇨ TEXAS

Summary of Policy: State law mandates the creation of voluntary guidelines for IAQ in schools, and regulations promulgate the guidelines.

Policy: Tex. Health & Safety Code § 385; 25 Tex. Admin. Code § 297.1-.6.

As described in Part B.2, this 1995 state law required the state Department of Health to adopt rules establishing "voluntary guidelines for indoor air quality in public schools, including guidelines for ventilation and indoor air pollution control systems." As a result, the state department of health created "Voluntary Indoor Air Quality Guidelines for Public Schools," which were adopted as regulations in 1997.

The non-binding guidelines are general in nature and cover a broad range of IAQ issues for existing schools and new construction. With respect to new construction, the key topics addressed are building design, maintaining acceptable indoor air quality during renovation, HVAC system testing, and commissioning of the building.

Observations: As discussed earlier, these voluntary guidelines have helped promote good IAQ practices in schools, although additional training and education resources could help broaden the impact by providing more detailed explanation of the general practices outlined in the guidelines.

EXAMPLE ⇨ WASHINGTON

Summary of Policy: State law provides for the development of best management practices; the resulting state-created manual describes required practices as well as recommendations for addressing IAQ in schools.

Policy: Wash. Rev. Code § 70.162.

As noted in Part B.2, state legislation provided funding to the Department of Education to work in conjunction with the Department of Health to develop best management practices for schools to address IAQ in new or modernized facilities. The "School Indoor Air Quality Best Management Practices Manual," created in 1995, focuses particularly on new construction practices.

The 175-page manual, prepared by the state Department of Health with funding from the state Superintendent of Public Instruction, provides a detailed discussion of a wide range of IAQ considerations for school design and construction. The manual includes a discussion of practices that are required by law, as well as those that are recommended by the agency as best management practices. The key sections of the manual addressing new construction are: assembling the design team; preparing an indoor pollutant source control plan; complying with codes and standards; assessing budget and scheduling impacts; site and facility planning; HVAC design recommendations; selection of materials, interior finishes, and furnishings; and design documentation.

Observations: As noted earlier, the Best Practices Manual has served as an important tool for the state in facilitating better school IAQ practices, particularly in new construction. Ongoing education and assistance provided to school districts by the agency is critical to implementation of the approaches discussed in the manual. According to state officials, the education department actively uses the manual. In school districts that are requesting significant state funding for new construction, the

department determines the extent to which the district is using the manual in its design and construction process. According to officials, the Seattle school district has used the Best Practices Manual in the development of numerous construction projects in the past few years.

EXAMPLE ⇨ MINNESOTA

Summary of Policy: State education law requires the state to develop and disseminate a number of manuals and other informational resources.

Policy: Mn. House File No.1 (Section 26, Subdivision 1).

This law, discussed in Part B, directs the state education agency to develop both a school IAQ maintenance manual and a "planning and construction manual to assure indoor air quality" in schools. The law sets out a number of items to be included in these manuals and, in particular, requires the construction manual to contain "architectural, engineering, maintenance engineering, and other design practices to positively affect indoor air quality."

Observation: In lieu of creating a new manual, the state education agency uses and distributes a detailed manual created by the Minneapolis school district. That manual provides recommended specifications for a range of IAQ design and construction issues, including thermal and moisture protection, finishes, furnishings, and IAQ management during construction. Minneapolis Public Schools, "Acceptable Indoor Air Quality for School Construction Projects." (rev. 2000).

EXAMPLE ⇨ NEW YORK

Summary of Policy: State-created manual describes both required and recommended practices and procedures for school design and construction, including IAQ practices.

Policy: New York state's "Manual of Planning Standards" (rev. 1998) is written primarily for school architects and engineers. It is comprehensive in scope and fairly detailed in its descriptions of both state requirements and recommended practices for new school construction and renovation.

Observations: This manual, while not specifically mandated by a state law or regulation, serves an important function in reiterating and expanding upon some of the IAQ-related requirements contained in state regulations. In particular, the section on material selection emphasizes the importance of considering potential adverse health effects and taking appropriate steps to prevent those impacts.

EXAMPLE ⇨ CALIFORNIA

Summary of Policy: A collaborative program involving several state agencies, along with non-governmental entities, to develop information, technical assistance and training on building schools that promote environmental quality, both indoor and outdoor.

Policy: The California "Collaborative for High Performance Schools (CHPS)" initiative is a joint effort among several California agencies, as well as various utility companies and non-governmental organizations, to promote the design and construction of "high performance" schools – buildings that are energy efficient and provide

healthy, comfortable indoor environments. Indoor air quality is a central element of the high performance school model. Key products of the initiative so far are technical design guidelines that incorporate resource efficiency, daylighting, and indoor air quality goals, and a "certification system" for high performance schools. The certification system defines a high performance school and seeks to be a resource for both designers and districts to resolve differences while completing a project within its allotted time frame and budget. See http://www.eley.com/chps (last visited Jan. 10, 2002).

Other educational components of CHPS include: information on the advantages, process, and budgeting issues associated with designing high performance schools; outreach at national or regional events, and workshops on high performance design for school districts in the state.

Observations: While the CHPS initiative is not the result of a state law or regulations, it is significant for a number of reasons: it involves a variety of state agencies; it addresses both indoor air quality and other "green building" issues; and it involves a program that combines training, education and voluntary standards. The long-term goals of the initiative include linking these informational activities with state policy and program efforts.

3. Strengthening the Public Right to Know About Indoor Air Quality in Schools

Providing the public with information about IAQ issues is one approach to encouraging greater attention to indoor air quality in the school design and construction process. The following are two examples of state that have incorporated public accountability and information access provisions into their policies governing health and environmental issues relating to school construction. As noted in Part B.4, state public records laws may provide another tool for communities to gain access to school records and documentation of school design and construction decisions.

State	Law/Regulation	Brief Description
New York	N.Y. Educ. Law §§ 409-d, 409-e; N.Y. Code R. & Regs. tit. 8, § 155.5	State education law and regulations requiring advance notice for school construction projects and providing for more direct community participation.
New Jersey	N.J. Admin. Code tit. 12, § 100-13.5	State labor regulations requiring advance notification of construction projects.

EXAMPLE ⇨ NEW YORK

Summary of Policy: State education law and regulations establish advance notification of construction activity and provide for the involvement of a school health and safety committee in monitoring construction.

Policy: N.Y. Educ. Law §§ 409-d, 409-e; N.Y. Code R. & Regs. tit. 8, § 155.5.

New York's education regulations require that school districts give advance notice to parents, staff and the community of school construction projects costing $10,000 or more that are to be undertaken in occupied buildings. The regulations require a minimum of two months notice, except for emergency construction projects, and mandate that the notice include a description of the state's health and safety requirements applicable to the construction.

New York's school facility regulations also contain a provision for more direct participation by the community in construction projects through the school health and safety committees, described in Part B.4 above. School districts must establish procedures for involving the committees in monitoring safety during construction projects. Among the requirements listed in the regulations are: expansion of the committees during a construction project, to include the project architect, construction manager and contractors; committee review of complaints related to health and safety impacts of the construction; and opportunity for a walk-through inspection by the committee to determine whether the area is ready to be reopened for use.

Observations: To help implement the pre-construction notification requirements, the state Department of Education has produced a sample notification letter that can be used by school districts and has posted the letter on its extensive web site. See http://www.emsc.nysed.gov/facplan/articles/preconstructionnotificationsample.html (last visited Jan. 7, 2002). The brief letter gives a general description of the health and safety precautions that must be taken, including a reference to the relevant state regulation. The amount of notice required might enable building occupants to take steps to avoid certain exposures during construction, but would not facilitate community participation in many of the design and planning decisions relating to a project. On the other hand, the use of the school health and safety committees to monitor construction projects is a potentially stronger mechanism for ensuring that any health and safety concerns are adequately addressed. The state's guidelines for health and safety committees provide that the committees should develop a protocol for monitoring construction, and refer the committees to the Sheet Metal and Air Conditioning Contractors' National Association (SMACNA) Booklet "IAQ Guidelines for Occupied Buildings Under Construction."

EXAMPLE ⇨ NEW JERSEY

Summary of Policy: State labor regulations address IAQ in schools and require advance notification of construction projects.

Policy: N.J. Admin. Code tit. 12, §100-13.5.

This state occupational health and safety regulations, discussed in Part B.1, require that school districts provide employees with at least 24 hours advance notice of work that may introduce air pollutants into the work area.

Observations: This regulation is considerably narrower than the New York regulations described above, in both the amount of advance notice required and the recipients of the notice. The New Jersey regulation is broader, though, in that the requirement applies to any "work to be performed on the building," and there is no minimum construction cost that triggers the requirement.

Part D

CONCLUSIONS

Poor indoor air quality in a school building can affect the health, productivity and general well-being of students and school staff. Over the past several years, mold and other indoor air problems in schools have led to widely publicized illnesses, school closings and costly school repairs in all regions of the United States. State legislatures and state agencies can make an important contribution to improving the quality of education and the management of school facilities by creating and implementing policies aimed at preventing indoor air quality problems.

A number of states already have policies in place that can address general IAQ issues in schools. This report has identified many of the policies that have been developed so far, described the key components of those policies, and highlighted current implementation efforts. Although the report is not an exhaustive compilation of policies relevant to IAQ in schools, the laws and regulations identified here illustrate how states have begun to tackle the challenge of improving air quality in schools. These laws, regulations and guidance documents can provide important background for future policy initiatives in this area. The following observations are drawn from the policies described here:

- State education, health and labor laws explicitly addressing general indoor air quality issues in schools are concentrated in a relatively small number of states. Maine and Minnesota have been particularly active in developing IAQ-specific legislation for schools. Several other states, including New York, Washington, New Jersey, Texas, California, Vermont, and West Virginia, have also crafted statutes and regulations in this area.

Schools across the country have been affected by indoor air quality problems, and increased attention to policies aimed at prevention can benefit schools in all states.

- Current state policies addressing indoor air quality in schools are not based on a single template or model policy. Differing institutional, political and social contexts have resulted in a variety of policy strategies. While there is no one-size-fits-all policy for addressing IAQ in schools, the approaches discussed in this report present different options for states to consider in developing new policies aimed at prevention – from more traditional regulatory requirements to financial incentives and education.

Some of these strategies involve the enactment of legislation — for example, laws that establish new financial assistance programs for IAQ maintenance and repairs or that direct state agencies to provide technical assistance or produce IAQ guidance documents. Other approaches use existing statutory authority as the basis for creating regulations or formal guidance. For example, school inspection programs can provide a vehicle for identifying and remedying indoor air quality problems. Many states already have general sanitary or environmental inspection programs in place, and can develop legislation, regulations or guidance to ensure that those programs promote key IAQ maintenance practices.

There is a need for creative approaches to state policy that build and

expand on current efforts to address indoor air quality in schools.

• While the growing public attention to indoor air quality in schools has focused largely on existing schools, new school construction is an important area for developing prevention-oriented policies. The substantial resources spent every year to build new schools in the United States presents a tremendous opportunity – and responsibility – to prevent indoor air pollution and to create healthy school environments. Moreover, greater attention to indoor air quality issues in new construction is particularly important as states increase their focus on resource conservation and efficiency in school facilities. Indoor air quality is closely related to decisions about energy systems, materials, and other building features. By integrating IAQ issues with energy efficiency, material selection and other resource conservation goals, school construction programs can maximize both the quality and the affordability of new and renovated school facilities.

State school construction funding programs represent an important opportunity to create healthy schools by incorporating key IAQ design and construction features.

• The subject of indoor air quality in schools presents unique implementation challenges for state policy initiatives. The policies described here illustrate some of the ways that states have addressed certain key implementation issues.

For example, it is important that state policies take into account the need to provide support for local agencies, in the form of education, training and technical assistance. Given the wide ranging technical issues involved, many local school districts or health departments need education or training in order to implement state IAQ policies successfully. It is also important that policies incorporate mechanisms and resources for state oversight, given the limited resources of most state indoor air quality and school facility programs. Finally, state IAQ policies can be more effectively implemented if they take into account the role of different state agencies, including the departments of education, health, labor and building services. If these different areas of jurisdiction over IAQ issues are not considered, the result may be overlapping or inconsistent state policies. Instead, state policies can draw on the respective strengths of these key agencies in establishing a coordinated approach to preventing indoor air quality problems in schools.

Regardless of the particular strategy adopted, state IAQ policies can be more effective if they address the need for local capacity-building, mechanisms and resources for state oversight, and coordination of different state agencies.

While the policies described here provide an important starting point for states considering this issue, they do not exhaust the possibilities for creating effective state programs to prevent indoor air quality problems in schools. This is a subject that allows, indeed calls for, creative policy approaches that will enhance the health, productivity and well-being of students and school staff.

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